

THE 100 MOST INFLUENTIAL PEOPLE IN ARTIFICIAL INTELLIGENCE

TIME 100/AI





THE
VAPORIZING,
DAYTIME,
COUGHING,
ACHING,
STUFFY HEAD,
SORE THROAT,
CONGESTED CHEST,
FEVER,
POWER
THROUGH
YOUR DAY,
MEDICINE.

READ EACH LABEL. USE AS DIRECTED.
KEEP OUT OF REACH OF CHILDREN.



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President Nayib Bukele's war on crime in El Salvador has made him one of the world's most popular leaders. At what cost?
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TIME's second annual list of the most influential people shaping the galloping new technology that stands to change the world as we know it

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The campaign to recognize that ultra-processed foods are not only unavoidable, but may also have a place in a healthy diet
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The central market in El Salvador's capital, San Salvador, on June 25
Photograph by Christopher Gregory-Rivera for TIME



This year's list shows what can happen when AI moves out of the lab and into the world

The stories shaping AI

AS WE WERE FINISHING THIS YEAR'S TIME100 AI, I had two conversations, with two very different TIME100 AI honorees, that made clear the stakes of this technological transformation. Sundar Pichai, who joined Google in 2004 and became CEO of the world's fourth most valuable company nine years ago, told me that introducing the company's billions of users to artificial intelligence through Google's products amounts to "one of the biggest improvements we've done in 20 years." Speaking that same day, Meredith Whittaker, a former Google employee and critic of the company who, as the president of Signal, has become one of the world's most influential advocates for privacy, expressed alarm at the dangers posed by the fact that so much of the AI revolution depends on the infrastructure and decisions of only a handful of big players in tech.

Our purpose in creating the TIME100 AI is to put leaders like Pichai and Whittaker in dialogue and to open up their views to TIME's readers. That is why we are excited to share with you the second edition of the TIME100 AI. We built this program in the spirit of the TIME100, the world's most influential community. TIME's knowledgeable editors and correspondents, led by Emma Barker and Ayesha Javed, interviewed their sources and consulted members of last year's list to find the best new additions to our community of AI leaders. Ninety-one of the members of the 2024 list were not on last year's, an indication of just how quickly this field is changing. They span dozens of companies, regions, and perspectives, including 15-year-old Francesca Mani, who advocates across the U.S. for protections for victims of deepfakes, and 77-year-old Andrew Yao, one of China's most prominent computer scientists, who called last fall for an international regulatory body for AI.

JUST TWO MONTHS after we launched last year's list, we witnessed one of the most dramatic recent events in the business world,

a moment that drew the world's attention to the individuals leading AI. In November 2023, OpenAI's board shocked the industry by firing CEO Sam Altman amid questions about his integrity. After his subsequent return to the company, Altman was recognized as TIME's 2023 CEO of the Year. Since then, several top safety leaders have left OpenAI, raising concern over the lab's—and the industry's—pace of development. OpenAI has promised to refocus on increased caution, installing a new safety committee, which it has said will assess the company's approach. Safety concerns animate many of the individuals recognized in this issue.

If the world of AI was dominated by the emergence of startup labs like OpenAI, Anthropic, and their competitors in 2023, this year, as critics and champions alike have noted, we've seen the outsize influence of a small number of tech giants. Without them, upstart AI companies would not have the funding and computing power—known as compute—they need to propel their rapid acceleration.

This year's list offers examples of the possibilities for AI when it moves out of the lab and into the world. Innovators including Zack Dvey-Aharon at AEYE Health and Figure's Brett Adcock are showing the real-world potential for AI to improve how we live and work.

Many industries, including media companies like TIME, are now partnering with leading AI companies to explore new business models and opportunities. The consequences of those moves will likely determine who appears on next year's list.

Since launching the TIME100 AI last September, we've been able to gather members of this group together in San Francisco and Dubai. We look forward to convening this group again in San Francisco and London later this fall as we continue to grow this community.

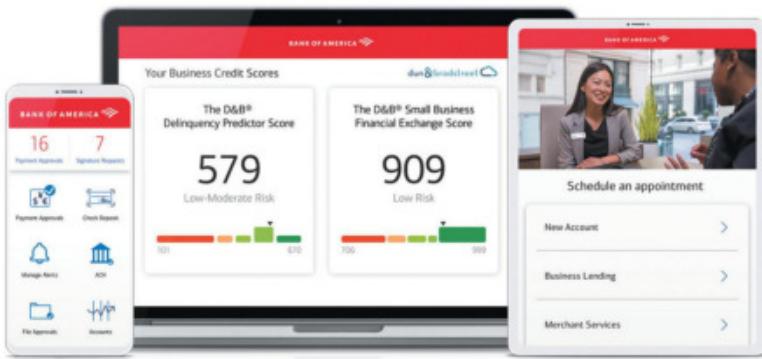


Clockwise from top left: Lisa Su, Ray Kurzweil, Sundar Pichai, and Amadeep Singh Gill

Sam Jacobs,
EDITOR-IN-CHIEF



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DNC 2024

Photographer Evan Jenkins documented the Democratic National Convention in Chicago, as Democrats nominated VP Kamala Harris. Whether he was capturing the crowd's raucous reaction to President Joe Biden's speech (right) or the best examples of swag (left), his goal, he tells TIME, was to show "how people express themselves individually and in a group when they believe in something strongly." time.com/dnc-photos



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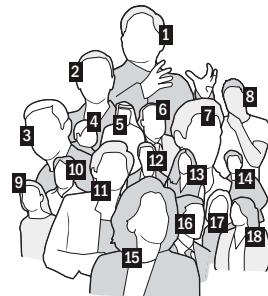
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PREMIERE *Viktor*, a TIME Studios documentary, debuted Sept. 8 at the Toronto International Film Festival. Olivier Sarbil's film is about the experiences of a deaf photographer during the Russian invasion of Ukraine.

On the covers



THE 100 MOST INFLUENTIAL PEOPLE IN AI

Photo-illustration by Klave Rzeczy for TIME

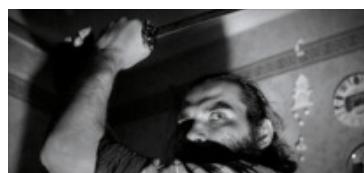
- 1) Jensen Huang
- 2) Scarlett Johansson
- 3) Vinod Khosla
- 4) C.C. Wei
- 5) Faisal Al Bannai
- 6) Amandeep Singh Gill
- 7) Arthur Mensch
- 8) Marques Brownlee
- 9) Sara Hooker
- 10) Ray Kurzweil
- 11) Lisa Su
- 12) Steve Huffman
- 13) Amba Kak
- 14) Anil Kapoor
- 15) Gina Raimondo
- 16) Sundar Pichai
- 17) Kristen DiCerbo
- 18) Helen Toner



Photograph by Christopher Gregory-Rivera for TIME



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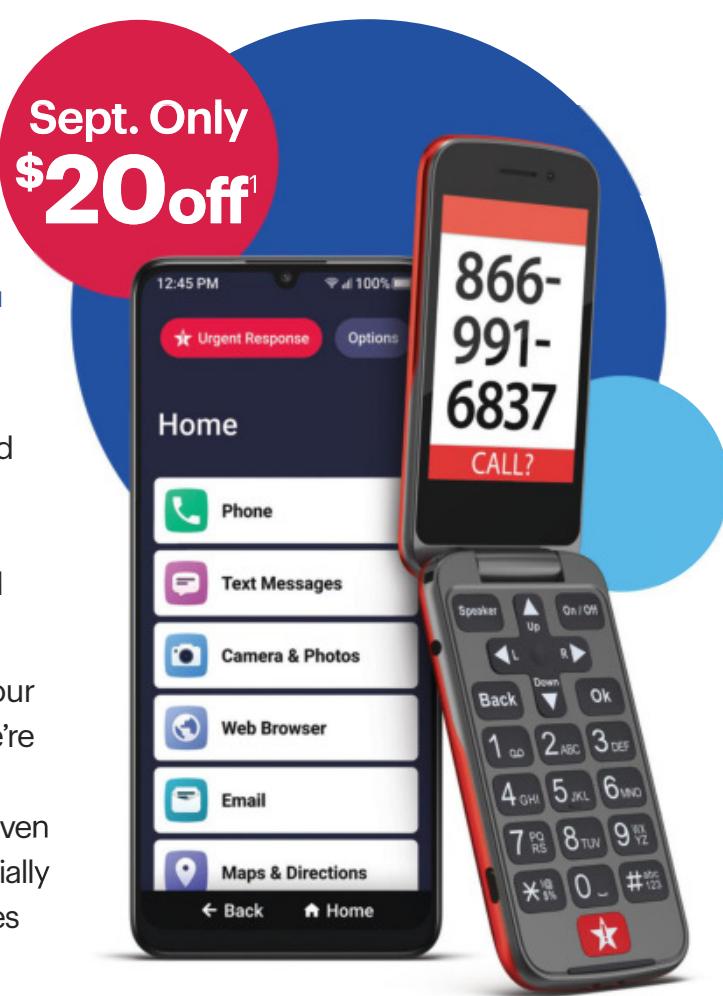
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The Brief



'LOOK FORWARD'

BY BRIAN BENNETT
AND NIK POPLI

Black women rooting for Vice President Kamala Harris don't want Donald Trump's taunts to distract her

INSIDE

POLIO IN GAZA SPARKS FEAR—AND VACCINATION EFFORTS

A NEW MISSION MOVES PRIVATE SPACEFLIGHT FORWARD

SUDAN'S HUMANITARIAN CRISIS COMES INTO FOCUS

DONALD TRUMP REPEATEDLY MISPRONOUNCES Vice President Kamala Harris' first name. He's said world leaders would treat her "like a play toy." He stunned a roomful of Black journalists in late July when he claimed Harris, who is both Black and of South Asian descent, "happened to turn Black" a few years ago. Belittling comments and demeaning monikers are tools Trump has wielded for decades in politics and business to try to denigrate his opponents.

This election is no different. And as the first woman of color running as a major party's presidential nominee, Harris will likely continue to see political attacks with racist or misogynistic undertones until Election Day.

For many Black women attending the Democratic National Convention in Chicago, the advice they had for Harris in the final weeks of the campaign could be summed up in four words:

Don't take the bait. "Some things you don't even need to dignify—act like you didn't even hear," said the Rev. Shari Nichols-Sweat, a 66-year-old retired high school music teacher from Chicago, who belongs to the same historically Black sorority as Harris, Alpha Kappa Alpha. "She is not to be played with, and nobody better ever think she is weak because she's a woman," said Nichols-Sweat as she left the United Center, having just watched Harris formally accept the Democratic Party's nomination for President.

Harris has seen this before. In her convention speech on Aug. 22, she recalled noticing as a child the challenges her mother faced as "a brilliant, 5-ft.-tall, brown woman with an accent" who immigrated to the U.S. from India at the age of 19 with a dream to become a breast-cancer research scientist. "But she never lost her cool," Harris said. "She was tough."

Harris is taking the same approach. Instead of expressing outrage at Trump's comments or calling them racist and sexist, she has often responded with a light touch, saying such comments are a part of the "same old show" of disrespect, and dismissing Trump and his allies as "weird" and Trump himself an "unserious man."

HARRIS IS SCHEDULED to come face-to-face with Trump in a prime-time debate on Sept. 10 in Philadelphia, where he may further question her racial identity and level personal attacks against her in front of a national TV audience. She's already doing debate-prep sessions to plan out how she will respond to Trump's tactics in person, according to campaign officials.

Former First Lady Michelle Obama, during her conven-

tion speech, addressed the racist rhetoric and attack lines that have been wielded against Harris, warning that people "are going to do everything they can to distort" her background and accomplishments. "My husband and I, sadly, know a little something about this," she said, before calling out by name Trump, who—though he has said he doesn't have "a racist bone in [his] body"—peddled unfounded "birther" allegations against Barack Obama, falsely alleging that Obama wasn't born in the U.S. "For years, Donald Trump did everything in his power to try to make people fear us. See, his limited, narrow view of the world made him feel threatened by the existence of two hardworking, highly educated, successful people who happen to be Black," she said. Obama offered a piece of advice to Harris: "Going small is never the answer," she said. "Small is petty, it's unhealthy, and, quite frankly, it's unpresidential."

Angela Alsobrooks, a Democratic Senate candidate who could also make history this cycle as Maryland's first Black Senator, tells TIME the racist and degrading attacks against Harris are a sign Trump's worried about losing. "He attacks her because she wins," she says. Harris' candidacy has "excited and engaged people," and she "should continue to be exactly who she is and continue working," Alsobrooks says.

Alexandria Alston, 33, a fashion designer from Chicago who attended Harris' convention speech, said the Vice President is playing it right to not give Trump's insults too much oxygen. "She is keeping her focus on what she needs to keep it on. Sometimes when people attack you, you have to look forward and not necessarily give them so

much attention." Those baiting comments were effective distractions in previous election cycles, Alston said. But she thinks this time is different: "You know this is a tactic of his, and so I don't think we're taking it."

Rather than hurt Harris, the attacks diminish the one lobbing them, said Krystal Kidd, a substance-abuse-prevention specialist from Southfield, Mich. Kidd used to respect Trump's business record, but not anymore. "I'm really disappointed because I really thought he was a dynamic businessman once upon a time," she said. His comments about Harris, she said, "show he hasn't done his due diligence to be competitive in this race." Like so many others at the convention, Kidd hoped Harris would continue to ignore such efforts by Trump.

"She doesn't have to do anything to push back against him," said Kidd. "Everything she's worked for speaks for her."





THE BULLETIN

Gaza's doctors face a new fight

POLIO HAS RESURFACED IN GAZA for the first time in 25 years, with the first case confirmed Aug. 16 in a 10-month-old unvaccinated child in Deir al-Balah, the enclave's health authorities said; the World Health Organization (WHO) announced in July that the virus had been initially detected in wastewater in the city. With routine immunization coverage in Gaza plummeting amid ongoing conflict, thousands of children are at risk.

THE RESURGENCE The re-emergence of polio in Gaza did not come as a complete shock, given the situation in the region since the Hamas attacks of last October, during which roughly 1,200 people were killed. More than 40,000 people have been killed in Gaza in the ensuing conflict, according to figures from the Hamas-led Gaza health ministry, which are considered reliable by the U.S. government and the

U.N.—and, unsurprisingly, routine immunization coverage, including for polio, has dropped. Today, fewer than half of all hospitals and primary-care facilities in Gaza are even partially operational, says Dr. Hamid Jafari, director of polio eradication for the WHO Eastern Mediterranean Region. The virus could have been circulating there as early as September last year. As access to vaccines declines, the virus takes advantage. “Any disease that [can] spread that way will eventually spread,” says Dr. Majed Jaber, a physician from Gaza who spoke to TIME from Al-Mawasi, a town in Khan Younis. “Kind of a Murphy’s law.”

FOR THE PEOPLE When Jonas Salk licensed the first version of a polio vaccine in 1955, it was meant to be universally accessible. When Salk was asked who owned it, he said, “Well, the people, I would say. There is no patent. Could you patent the sun?” In the past few decades, the Palestinian vaccination effort was a success, in large part because of the ease with which parents could take their children to hospitals for scheduled doses. Gaza had been

Abdul Rahman Abu al-Jidyen, an 11-month-old with polio, with his mother in Gaza, on Aug. 27

polio-free since 1999, according to the U.N., and Jafari says prewar vaccination rates were as high as 99%.

INTERVENTIONS A U.N. vaccination campaign aims to send out 708 teams to hospitals in Gaza. But the logistics are daunting. At least two rounds of vaccinations are planned to treat all children in Gaza under the age of 10, but the vaccines rely on refrigeration equipment, which requires steady electricity as well as fuel—a resource Israel has blocked from entering Gaza. While the U.N. has requested a “polio pause” in fighting in order to conduct its campaign, several people familiar with the situation argue that combatting the virus in Gaza requires a true cease-fire. “We all want to be hopeful,” says Dr. Susan Kullab, an infectious-disease specialist who volunteered in Gaza in May. “But the reality is that without cease-fire, this is very challenging.” —JUWAYRIAH WRIGHT

GOOD QUESTION

Why is the NFL giving old kickoff rules the boot?

BY SEAN GREGORY AND LON TWEETEN

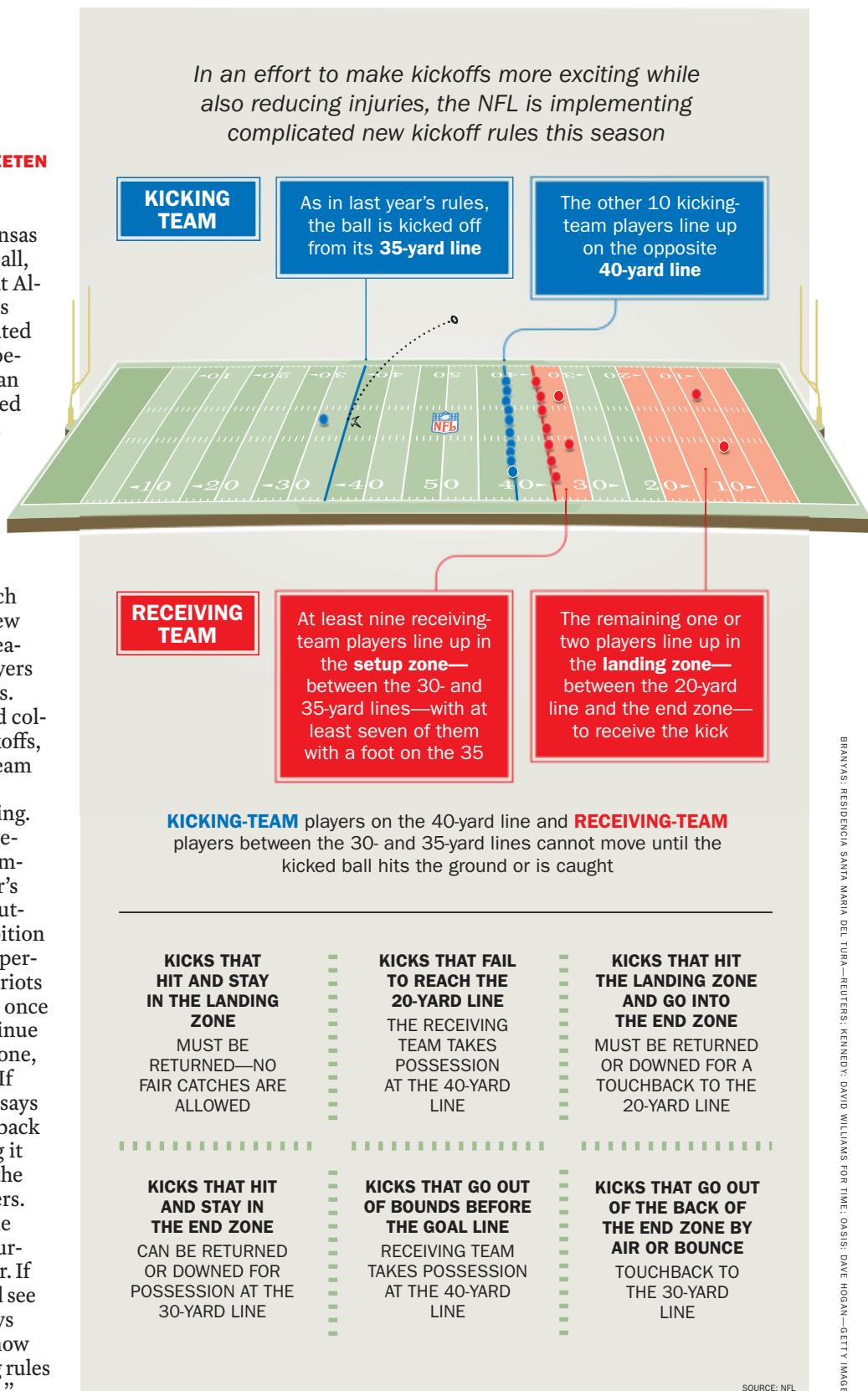
ON SUPER BOWL SUNDAY IN LAS Vegas, Harrison Butker of the Kansas City Chiefs approached the football, as many in the crowd of 62,000 at Allegiant Stadium held their phones aloft to capture the most anticipated moment of the NFL season: the beginning of the big game. More than 100 million rapt viewers also tuned in. Butker's boot, however, sailed over the head of the San Francisco 49ers kick returner, out of the end zone for a touchback. Bor-ing. There were 13 kickoffs in Super Bowl LVIII. And 13 dull touchbacks.

The NFL is seeking to sack such tedium. The league has passed new kickoff rules for this upcoming season, which begins on Sept. 5. Players will now line up in closer quarters. The goal: eliminate the downfield collisions that cause injuries on kickoffs, while incentivizing the kicking team to put the ball in play.

The early returns look promising. More than 70% of kickoffs were returned in the 2024 preseason, compared with 54.8% during last year's preseason. But teams are likely putting kickoffs in play during exhibition games to evaluate their coverage personnel. Former New England Patriots coach Bill Belichick predicts that once the games count, teams will continue to boot the ball beyond the end zone, as Butker did in the Super Bowl. If you want to create more returns, says Belichick, move the kickoff spot back to the 20- or 25-yard line, making it more difficult for the Butkers of the world to loft the ball over returners.

Belichick's idea does make some sense. But here's good news: the current new format is in play for a year. If it flops, the league can fix it. "We'll see what happens during the year," says Walt Anderson, a former ref who now works for the NFL as its officiating rules analyst. "Everything's on the table."

In an effort to make kickoffs more exciting while also reducing injuries, the NFL is implementing complicated new kickoff rules this season



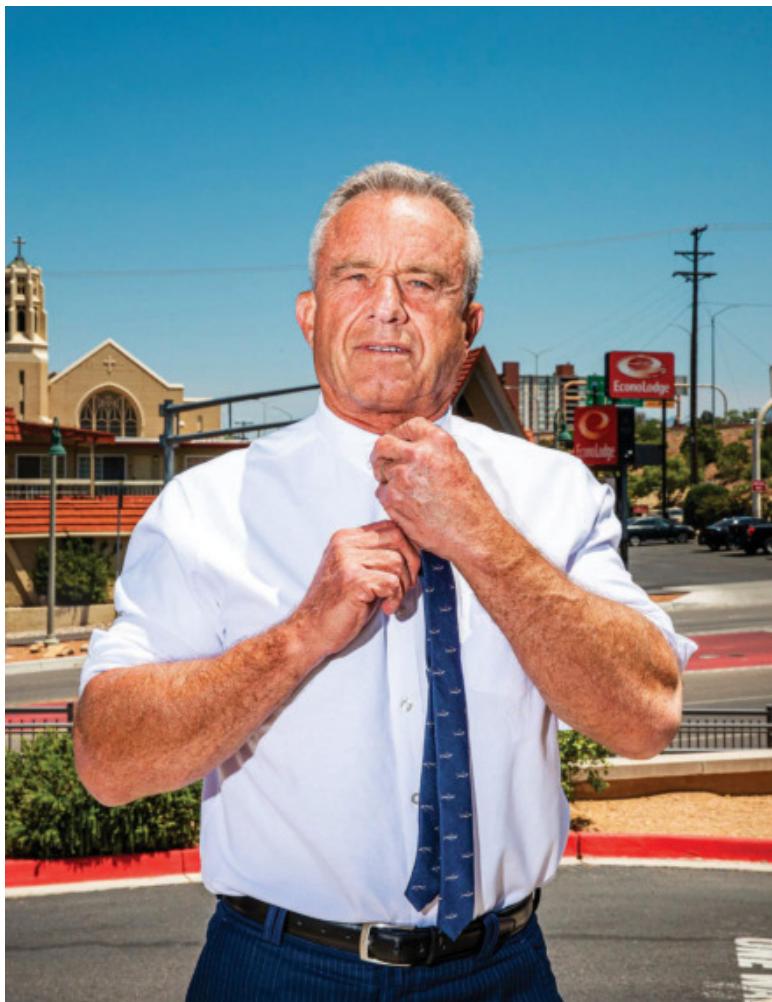
DIED

Maria Branyas*World's oldest*

Among the key moments in Maria Branyas' life—her birth in San Francisco in 1907; a move to Catalonia in 1915; her marriage to a Catalan doctor named Joan Moret; and having three children—one that took place in January 2023 stands out. That was when she became the world's oldest person, a title she held until she died at 117 in a Spanish nursing home, which her family announced Aug. 20. Branyas' age was verified by the nonprofit Gerontology Research Group.

Branyas, who lived through the 1918–1920 flu pandemic, gained fame in 2020 after she became the then oldest known person to recover from COVID-19. "This pandemic has revealed that older people are the forgotten ones of our society," she said after her recovery. "They fought their whole lives, sacrificed time and their dreams for today's quality of life."

—Anna Gordon



ENDED

RFK Jr.'s presidential campaign*A long-shot bid crashes*

INDEPENDENT PRESIDENTIAL CANDIDATE ROBERT F. KENNEDY JR.'S sputtering presidential bid came to an end on Aug. 23, when he suspended his campaign in what he said was an effort to make sure Democrats don't win the White House. "In my heart, I no longer believe I have a realistic path to electoral victory," Kennedy said as he announced the decision in Arizona.

A member of one of America's most prominent political dynasties, Kennedy gained notoriety for strange personal stories and his promotion of vaccine conspiracy theories. He joined the race as a Democrat, but dropped out of the primary to launch an independent bid that, though much talked about, ultimately failed to gather steam; a CBS poll from earlier in August found his popularity lingering at just 2%. Kennedy said he didn't want to play spoiler between former President Donald Trump and Vice President Kamala Harris, and will now support Trump, based primarily on three issues: free speech, the war in Ukraine, and what he called "the war on our children." The endorsement was a swerve from the liberal legacy of his family—which has publicly reproached him for his bid and his views—but no surprise from the candidate, who in his departure speech derided both the Democratic Party and the political system as a whole. "In an honest system," he said, "I believe that I would have won the election."

—SIMMONE SHAH

FILED

A new indictment of Donald Trump, over the Jan. 6 insurrection, by special counsel Jack Smith on Aug. 27; it focuses on actions Smith argues were made in an unofficial capacity and thus may not be immune from prosecution.

PLAYED

Clocking in at 5 hr. 35 min., the **longest tennis match in U.S. Open history**, between Karen Khachanov and eventual winner Dan Evans on Aug. 27.

LAUNCHED

A barrage of more than 200 missiles and drones by Russia's military into Ukraine, starting Aug. 26, killing at least seven people; some of the strikes were intercepted by Western-supplied F-16 jets.

IMPOSED

A **100% tariff on Canadian imports of China-manufactured electric vehicles**, Canada's Prime Minister said Aug. 26, matching a similar U.S. tariff to counter China's strategy to dominate the market through subsidies.

REUNITED

English rock band **Oasis, for a U.K. and Ireland tour next year**, ending its 15-year hiatus due to a feud between bandmates (and brothers) Liam and Noel Gallagher.



SPACE

Polaris Dawn opens a new chapter in space

BY JEFFREY KLUGER

IT WAS A VERY BIG DEAL ON SEPT. 14, 1966, WHEN ASTRO-nauts Pete Conrad and Dick Gordon flew their Gemini 11 spacecraft to a record altitude of 850 miles. It has remained a big deal for 58 years, while that benchmark for a crewed spacecraft in Earth orbit remained. But things are changing: the crew members of the Polaris Dawn mission are set to fire their thrusters and climb to a new record of 870 miles, venturing farther from home than any other astronauts on a nonlunar mission have ever traveled.

The Polaris Dawn crew look to notch other achievements too—becoming the first commercial astronauts to perform extravehicular activity (EVA, also known as a spacewalk), and the first to test communications between a spacecraft and the satellites that make up the SpaceX Starlink system. Also on the manifest: a suite of more than 40 scientific experiments, testing the SpaceX Dragon spacecraft at altitudes that would take it through the Van Allen radiation belts, and more than a dozen studies of the crew members themselves, including exploring what to do about the stubborn problem of space motion sickness, which is experienced by 60% to 80% of all space travelers during their first two or three days off Earth. In addition, Polaris Dawn—which had a planned launch date of Aug. 26, before that date moved several times—hopes to raise tens of millions of dollars for St. Jude Children's Research Hospital.

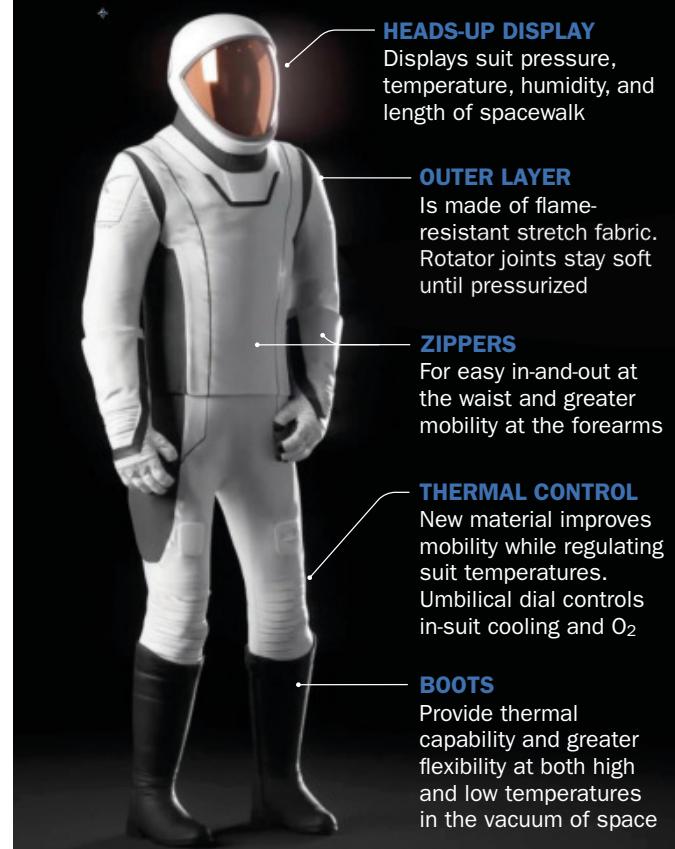
The mission has been bankrolled by Jared Isaacman, the founder and CEO of Shift4, an internet payment company. Polaris Dawn marks Isaacman's second trip to space, after the mission of Inspiration4, in September 2021. That journey too raised money for St. Jude, Isaacman's favorite charity, and was the first time an all-civilian crew went to space. For both missions, Isaacman was a paying customer of SpaceX, buying seats aboard the Dragon at a reported \$50 million each. But Polaris Dawn has a bigger mission, kicking off the first of three flights in the Polaris series, which could produce two firsts: private crews performing maintenance on the Hubble Space Telescope and the maiden mission of SpaceX's cutting-edge Starship rocket.

"We named the Polaris program after our North Star," says Isaacman, "which is actually a constellation of three stars, and Polaris is contemplated to be three missions."

Isaacman could be on all of those Polaris flights, which would give him a total of four trips into space, making him one of the world's most experienced astronauts—despite his never having been part of NASA or any other governmental space program. This time around, the crew includes pilot Scott Poteet, a retired Air Force lieutenant colonel and vice president of strategy at Shift4; mission specialist Sarah Gillis, a lead space operations engineer at SpaceX;

Boldly going

A SpaceX Falcon 9 rocket was set to launch the Dragon spacecraft on a five-day mission that could reach the highest crewed orbit ever flown. The mission, called Polaris Dawn, included a planned spacewalk with specially designed suits



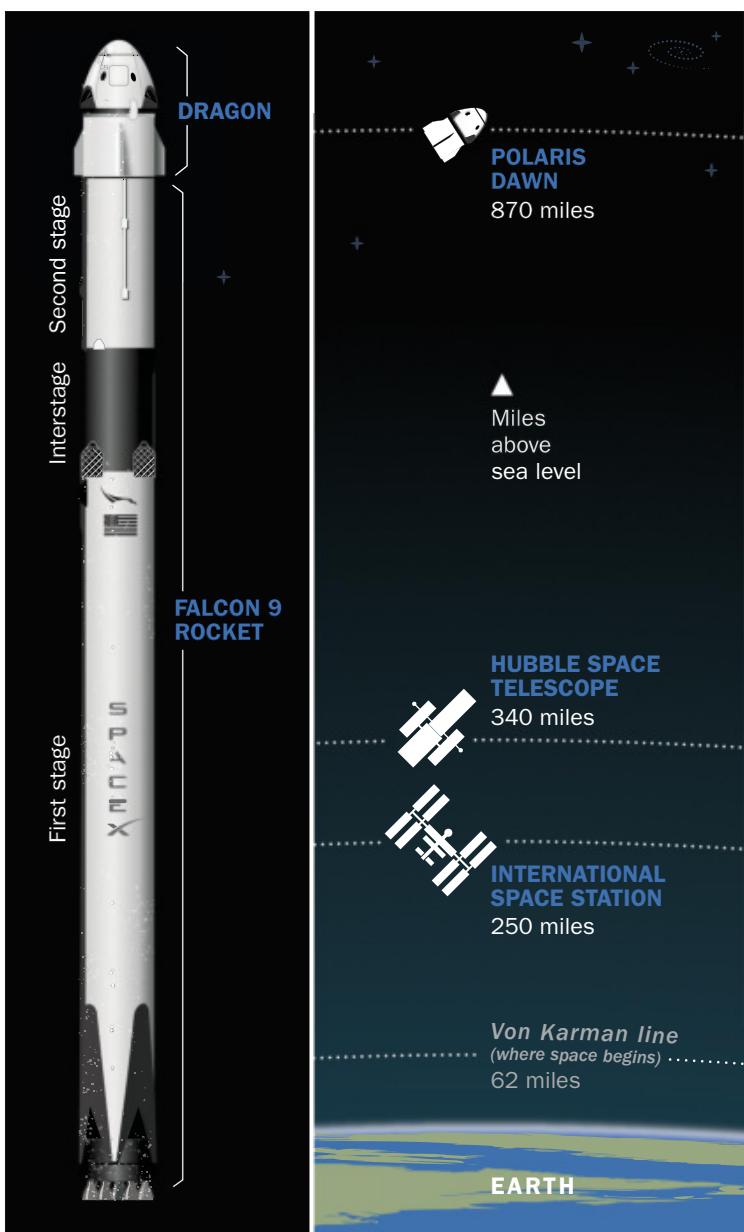
SOURCE: POLARIS PROGRAM

and mission specialist and medical officer Anna Menon, another SpaceX lead space operations engineer.

'We named the Polaris program after our North Star.'

—JARED ISAACMAN,
COMMANDER

FOR ALL OF THE CONTRIBUTIONS to science the Polaris series could make, it is the possibility of servicing Hubble and raising its altitude to a stabler orbit that might be the greatest. Hubble has been aloft since 1990 and has established itself as one of the most important cosmic observatories ever built. Five servicing missions conducted by space-shuttle crews helped extend its life, but since the shuttles stood down in 2011, the telescope has



always been just one breakdown away from going offline for good. A new servicing mission by a new crew could keep it in operation for years to come.

"There's been a study conducted with SpaceX, Polaris, and NASA, on the feasibility of boosting Hubble," says Isaacman. "[It's] a pretty easy risk-reward ratio in my mind."

Flying the maiden mission of Starship—which would happen on the third Polaris flight—would be no small thing either. The spacecraft has been selected by NASA for use as its Human Landing System, the lunar module for the Artemis program, which aims to

have astronauts back on the moon before the decade ends.

Polaris Dawn, however, is first out of the gate for the series, and it has been given manifold jobs to do. The business of puzzling out space sickness could go a long way toward making space habitation and settlement more practical.

"You can't have this great SpaceX vision of putting hundreds of thousands of people in space if half of them are throwing up, because the other half are going to throw up too," says Isaacman.

The Polaris Dawn crew was also chosen as the first to try out a new, more robust space-suit design. It can protect astronauts not only inside a nominally pressurized spacecraft, but also in the hard vacuum and extreme temperatures encountered during EVAs. It could someday do the same on the surface of the moon.

The Starlink work is groundbreaking too. More than 6,200 Starlink satellites are currently in orbit, and up to 42,000 could eventually be deployed. The system, which has most famously been used by both Ukraine and Russia in their ongoing war, provides broadband service from the sky to the ground, but trying to use it between two spacecraft would be new. Polaris Dawn plans a proof-of-concept experiment establishing that it could be done.

Life aboard Dragon during a five-day mission like Polaris Dawn is relatively comfortable. The four-person spacecraft has a habitable volume of 328 cu. ft., roomier than the three-person, 210-cu.-ft. Apollo. In orbit, that volume goes further still, since a weightless crew can make use of extra ceiling and bulkhead room.

The crew's food is better and fresher than commonplace astronaut food too—at least for the first 2½ days. "The fresh-food options include little sandwiches, pizza slices, and empanadas—before you get into Clif Bars, beef jerky, and stuff like that," said Poteet, during training for the Polaris Dawn mission.

An earthly audience was set to follow the mission as it unfolded—with liftoff, EVA, splashdown, and more broadcast live. Menon, the mother of two small children, plans to read from orbit a children's book she co-authored titled *Kisses From Space*, about a cosmic dragon and her earthly babies. Copies of the book are being sold on the Polaris Dawn website, and the one that Menon carries to space will be auctioned off, with proceeds going to St. Jude.

Music from space is on the schedule as well. During Inspiration4, crew member Chris Sembroski played the ukulele for viewers at home. Polaris Dawn's Gillis is a classically trained violinist and plans to take her instrument to orbit, performing live to audiences on the ground.

Menon and the other crew members, of course, take little about their mission lightly. A journey like this requires lifting off atop a 23-story Falcon 9 rocket generating 1.7 million lb. of thrust, and flying a 13,228-lb. Dragon around the world at 17,500 m.p.h.—or 4.9 miles per second. A lot can go wrong with that thrust, weight, and speed. The men and women who signed up for the Polaris Dawn mission went in knowing that they would be taking their chances—chances in the interests of high adventure, yes, but solid science too. □

Beyond Sudan

Perched just inside Chad, Adré has become the passing point for more than 600,000 Sudanese refugees fleeing civil war and famine in the past 16 months. "I've seen a lot of things related to migration in many places, but this was the first time that I really felt that it couldn't be worse than that," says Nicolò Filippo Rosso, a documentary photographer who went to Chad in June and July for missions with the U.N. Refugee Agency and World Health Organization. The photographer typically composes black-and-white work, but has used color in this project to better encapsulate the "dignity that the Sudanese refugees have and their openness to each other."

Photographs by Nicolò Filippo Rosso
 ► For more of our best photography, visit time.com/lightbox



1. Sudanese refugees wait for the World Food Programme monthly distribution at Adré refugee camp on July 3

2. Women cover themselves with shawls while a sand-storm ravages the Adré camp, scattering waste

3. Sudanese refugee women collect water from a well in Adré

4. People unload food from World Food Programme trucks during the monthly distribution at the Adré camp



5. Afrah Amdelkarim Hamid, 24, and her child, 2-year-old Mandoub, wait at a Doctors Without Borders hospital in Aboutengue, Chad

5 steps for a simple skin-care routine

BY ANGELA HAUPt

WALKING DOWN the skin-care aisle can cause sensory overload. Gels, creams, essences, and serums—so many serums!—promise to revitalize, exfoliate, hydrate, brighten, soothe, correct, and all but reverse time. What's a skin-care novice to choose?

Stick to the basics, says Dr. Jessica Wu, who practices cosmetic and clinical dermatology in Beverly Hills, Calif. The first step to developing the best routine is to understand your own skin: Is it oily, dry, or in between? To figure that out, wash your face, and then consider how it feels two hours later. “Is it oily? Is it dry and tight, or is it feeling pretty?” Wu asks. “That gives you a general idea of where you fall in that spectrum.”

From there, you can design a routine that requires only a handful of products and a few easy steps, experts said. In the morning: wash your face with cleanser, then apply vitamin C serum, moisturizer, and sunscreen. At night: cleanse your skin, then pat on retinol and moisturizer.

Here's how to pick the right versions for you.

1. Cleanser

Washing your face for 60 seconds with a gentle cleanser every morning and night resets your skin. If you have dry skin, look for a creamy cleanser, Wu advises. If you're oily, opt for a gel or foaming cleanser to help break up the oils. Alexis Pfrommer, an esthetician who owns ästhetik spa and skin care in Punta Gorda, Fla., suggests cleansers with hyaluronic acid, vitamin E oil, and glycerin, all of which help hydrate the skin. Avoid fragrances, sulfates, parabens, and alcohol, which can be irritating.

2. Vitamin C serum

Vitamin C is a powerhouse anti-oxidant that helps protect skin from particles called free radicals that are created by UV rays. Apply a few drops every morning to safeguard your collagen, Wu says, right after you wash your face. Look for one that also includes vitamin E, she suggests—the combination is stronger than just vitamin C alone. It should be sold in an opaque container that protects it from light.

3. Moisturizer

Skin gets drier with age, which is why moisturizing is essential. “It can be really important to repair that skin barrier, so bacteria and yeast don't cause a problem,” says Dr. Leah Ansell, an assistant professor of dermatology at Columbia University. Apply it after your morning vitamin C serum, and as the final step in your nighttime routine. Ian Michael Crumm, an esthetician in New York, suggests those with oily skin opt for a water cream moisturizer, which is lightweight; people who run dry might benefit from a richer, thicker moisturizer.

4. Sunscreen

Sun damage can happen year-round—your car windows let in harmful UVA rays, for example—so sunscreen should be the last thing you put on every day. Opt for one that's SPF 30 to 50, Wu advises. (Going much higher doesn't offer additional protection.) If you have sensitive skin, look for mineral sunscreen instead of a chemical version, she says—it's less likely to be irritating.

5. Retinoids

Retinoids are derived from vitamin A, and they can help keep your skin looking youthful. They are sold over the counter (as retinol) and with a prescription. Most people do well with retinol, but some people with acne or other skin conditions benefit from prescription products. Ask your dermatologist which is best for you. Just start slowly: apply a thin layer to your face before you go to bed, but only every other night for about a month, since retinoids can be drying.





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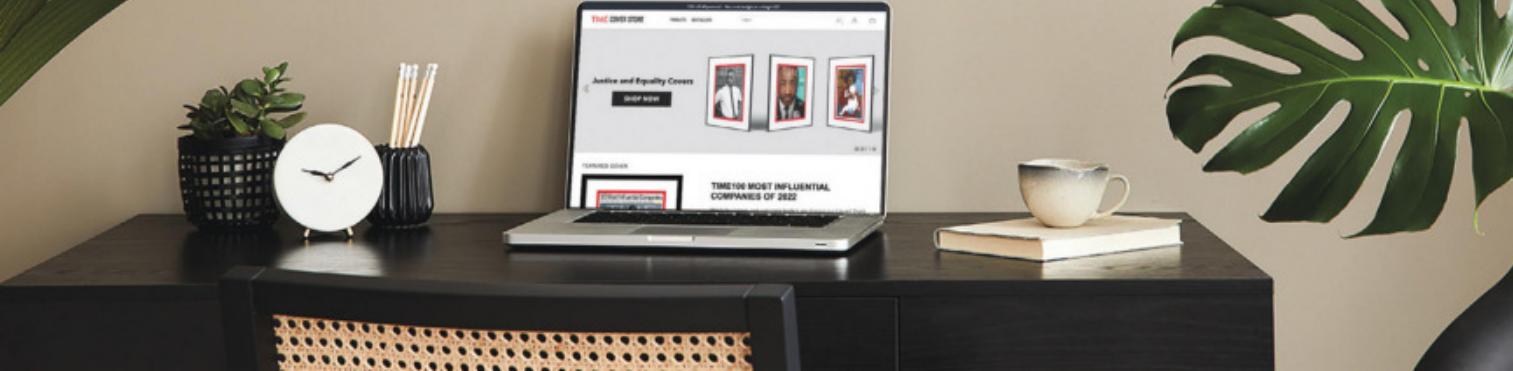
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The View



**THE GROWNUP'S GUIDE
TO FRIENDSHIP**

It's never too late to make new friends

BY ANGELA HAUPT

CHRIS DUFFY ISN'T GOING TO SUGAR-coat it: making friends as an adult is hard. If you've ever tried to figure out exactly how to ask a potential platonic connection for their number—or word that first follow-up text—you know what he's talking about. "It's mortifying," he says. "It requires being vulnerable and cringeworthy and putting yourself out there."

Social awkwardness aside, it's simply harder to meet new people when you no longer have shared high school classes or a college dorm room, says Duffy, author of *Let's Hang Out: Making (and Keeping) Friends, Acquaintances, and Other Nonromantic Relationships*. Add in long work hours, a fear of rejection, and lack of trust, and it's no wonder many people struggle to form new bonds.

Yet despite these obstacles, it's important to invest time and energy into growing your community: friendships keep us mentally and physically healthy. We asked Duffy and other experts how to approach making new friends through different life stages.

Early adulthood

Your 20s are the ideal time to start reflecting on your own friendship-building style—knowledge that will serve you for the rest of your life. In part, that means figuring out whether you're a joiner or an initiator, says Nina Badzin, who hosts the podcast *Dear Nina: Conversations About Friendship*. As a joiner, you'll make it a point to proactively opt in to activities or events you find interesting, like dance classes, a kickball league, or a professional networking group. If you're an initiator, you'll step up to organize get-togethers. "Maybe you invite two people, and those two people invite two people," she says. Being a joiner and being an initiator both require conscious effort; knowing which you are will help you determine the best approach to making friends.

You'll likely meet lots of people at



work—proximity fuels close bonds—and those connections can lead to other connections. "The acquaintance you made at this thing may stay an acquaintance, but maybe you meet someone through that person who becomes a friend," Badzin says. "It takes time. In your 20s, you're planting these little seeds that hopefully will blossom later." So if you hit it off with your colleague's roommate at happy hour, exchange numbers and then actually follow up to plan another time to hang out. If that sounds daunting, remember that one of you has to make the first move.

"Why not let it be?" Badzin asks. "Somebody has to be brave. We really are in much more control of our social lives than we think."

When you're a new parent

After becoming a parent, you might feel too exhausted, at least at first, to even consider bringing another new person into your life. But the early months of parenthood can also be isolating, especially if it's mostly just you and your baby all day in the beginning, and it can be nice to bond with

someone over all the new experiences, hopes, and worries that come with this major change in life.

That's why Duffy suggests leaning in to low-effort opportunities and starting with people in the vicinity: other parents at the playground, at "parents and babies" sessions at the local library, or at a new-mom or new-dad support group. Duffy likes to take walks with his baby,

Friendships keep us mentally and physically healthy

and he's found that he regularly crosses paths with people doing the same. The easiest thing to do, he says, is give a slight nod and perhaps say good morning. But if he wanted to

take it a step further, he'd stop and say, "Hey, I've seen you walking around with your baby before. I'm Chris. What's your name?"

Throughout midlife

When you enter your mid-30s, and as you cycle through your 40s and 50s, it can be helpful to reframe how you think about friendship. "As we get older, gone are the days of having that one, all-encompassing best friend" you might have relied on in your 20s, says Rachel Ann Dine, a licensed

professional clinical counselor in Agoura Hills, Calif. “Be open to being part of different friend groups that fulfill the different pieces of who you are as an adult.”

Dine suggests regularly setting small connection goals for yourself: going to a group workout class once a week and smiling at somebody, giving your neighborhood book club a chance, joining a pickleball team, tagging along with your co-workers for drinks once a month. “You may not hit it off with anybody the first time you go, but that doesn’t mean your person won’t show up,” she says.

Duffy, meanwhile, is a proponent of finding ways to regularly spend time at the same place, like a favorite café or the library down the street. “If you go to the same coffee shop every day, I guarantee you, you will get to know the people who work there on that shift, and you’ll probably get to know other people who go there,” he says. These repeated low-stakes interactions, as he describes them, can evolve into meaningful relationships. Plus, when you’re lonely, it’s simply nice to have someone know your name.

Senior years

Think you’re too old to make new friends? You couldn’t be more wrong, Badzin emphasizes—but you have to stay open to the possibility and find ways to put yourself out there, like joining a group to play games or taking up a class with built-in socialization. “I don’t love yoga as much because you don’t talk during yoga,” she says. “If it’s a silent experience, you’re not really going to meet someone.”

You might find that intergenerational friendships, in particular, are rewarding. Dine recently befriended a “funky, wonderful” woman in her late 80s—meaning the two have a 50-year age gap. They met at an antique store and have already gone out to coffee several times. Duffy, meanwhile, met a 102-year-old friend at the local swimming pool, and he’s since enjoyed hanging out on her front porch sipping iced tea. “It’s incredible and beautiful and kind of wild,” he says. “I get so much out of having older friends and younger friends.”

HOW TO KNOW IF YOUR DYNAMIC IS TOXIC—AND WHAT TO DO ABOUT IT

BY ANGELA HAUPR

Friends can be great—until they’re not.

Psychologists say they hear often about so-called toxic friendships, which veer away from the health benefits we’re accustomed to and instead take a hammer to emotional and psychological well-being. “A lot of what I see in these dynamics is that one person is acting in good faith, and the other is being manipulative or controlling,” says Brooke Sprowl, a therapist in Santa Monica, Calif. “It really takes a toll on your self-trust, because you’re being told that if you set boundaries, you’re being selfish, or if you’re not giving in to all of their needs, you’re letting them down.” People with toxic friends might also experience self-doubt, she adds, as well as anxiety and depression.

But how do you know if your friendship is indeed toxic? For one thing, such friendships are often one-sided. You might notice you’re always the one initiating conversations, making plans, and generally keeping the friendship alive. You might even start to feel like your friend’s pseudo-therapist. “You’re listening to their concerns and giving them advice, but you’re not getting that same kind of treatment and respect in return,” says Dr. Sarah Quaratella, a psychiatrist in Denver who works with college students often struggling with toxic friendships. “You become a vessel for a friend’s trauma dumping, but they can’t remember your dog’s name.”

Boundary violations are also common: if you’re not a night person, and you tell your friend that after 8 p.m. you’re going to be on the couch in front of the TV, they shouldn’t keep calling you at 11.

If you find yourself in this type of relationship, it’s a good idea to give yourself time to figure out how to proceed. Take a step back from the situation and talk to your support



system to get some perspective, Quaratella urges. Talk through your long-term expectations: What are your hopes for the friendship? What needs to change, and realistically, will it? You can start to “come up with ways to preserve your integrity and self-respect, while also advocating for yourself,” she says.

Sometimes, there are changes you can personally make that will prove helpful. If you make it a point to practice emotional-regulation strategies, you might not feel as triggered by your friend’s behaviors, says Jenna Brownfield, a psychologist in Minneapolis. “You can start to see, is that enough to shift the dynamic between us? Me being able to stay calm when things get heated?” she says.

Otherwise, it’s time for a direct conversation. The best way to approach it, Brownfield says, is to focus on the pattern hurting your friendship. “Have that common enemy of like, ‘What is this pattern playing out between us, and how do we conquer it together?’” Improvement is possible, she says—but it won’t happen overnight. After you’ve talked, if you notice old behavior flaring up again, call attention to it: “Oh my gosh, there we went again.” If the situation continues to deteriorate—or if your friend isn’t committed to positive change—it may be time to part ways.

HOW TO RECONNECT IF YOU'VE LOST TOUCH

BY JAMIE DUCHARME

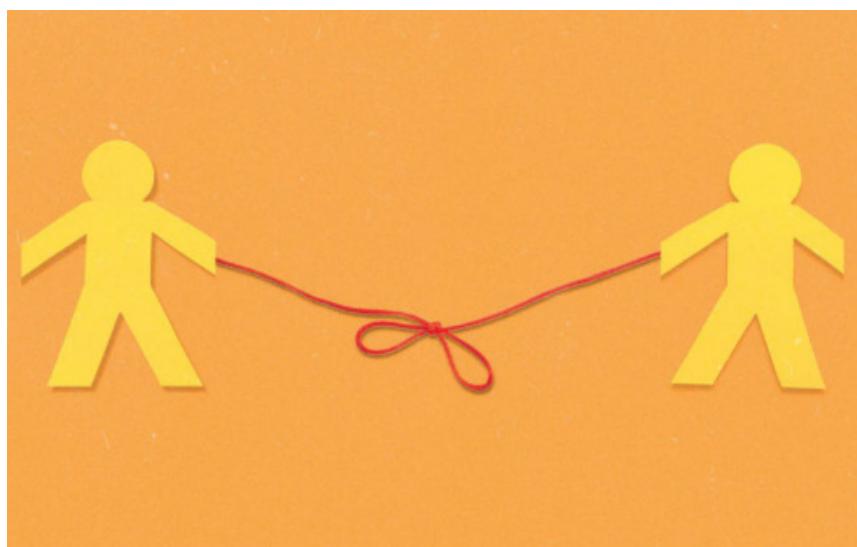
Long-term friendships often involve multiple “turning points,” or moments when bonds either fray or tighten, studies show. Turning points can be dramatic, like a betrayal, or mundane, like moving away for work. The former may be more complicated—though not impossible—to address, but even if you simply drifted apart, it can take some effort to get back on track.

First things first: get out of your own head. Research suggests people resist contacting old friends because it feels awkward or they fear the outreach won’t land. But people typically respond well, even more so when the interaction is unexpected, says Miriam Kirmayer, a clinical psychologist who specializes in adult friendship. Sending that message is “an opportunity to make someone’s day,” she says.

That said, your overture is more likely to work if there’s a reason for it. The reason may be obvious—you just moved to their city—or you may have to create one, Kirmayer says. It can be something as “simple and earnest” as telling the person you’re not sure why they are on your mind, but you thought of them, she says. The idea is to make it clear why you decided to reach out.

Kirmayer recommends starting with a baby step, like a message on social media, to take the pressure off. But if you can, eventually progress to in-person friend dates, says Jessica Ayers, an assistant professor at Boise State University who studies friendship. “Doing things in person, having that eye contact, and being able to disclose things” face-to-face will make it easier to get to know each other again and signal that you’re serious about reconnecting, she says.

Finally, try to bring your connection into the present, rather than leaning solely on nostalgia, Kirmayer says. Ask about their current interests and hobbies—or perhaps even try to find new ones together.



Long-distance relationships aren't just for romance

BY ANGELA HAUPT

NURTURING LONG-DISTANCE friendships takes work, but the payoff is worth it—and even small gestures can keep bonds alive. “You have to find ways to keep that friendship special,” says Kristen Suleman, a therapist in Houston. “It’s all too easy to have different schedules and live in different time zones, and be like ‘Out of sight, out of mind.’ You have to let that person know they matter to you, and that the role they play is irreplaceable.” Here’s how she and other experts recommend keeping those bonds strong.

Schedule regular catch-ups

Suleman and her friends plan monthly or bimonthly calls, often after their kids’ bedtimes. “We schedule them a few weeks out,” she says, because otherwise busy schedules might keep them from making it onto the calendar. When Suleman wants to let friends know she’s thinking of them, she Venmos them \$5 or \$10 and tells them to get a treat on her. “Sometimes we do that right before a catch-up call,” she says, “and it’s like we’re having coffee together because we went and bought it for each other.”

Find small ways to keep each other updated on daily life

When you and your friend live in different parts of the country, you miss out on all the day-to-day details that

create a shared history. That’s why Milwaukee therapist Jerilyn Adams suggests keeping each other updated: sending links to restaurant menus before you go out to eat, for example, and mentioning the names of the people you’ll be with, instead of simply referring to them as “friends.” Another way to do that is to send audio messages throughout the day, rather than waiting until you have time to craft the perfect email.

Create a shared photo album

Suleman and her friends send photo texts regularly, but sometimes things get lost in the chaos of the day. So they created a shared album that they can all add to and peruse when time allows. “There’s no pressure or expectation, but whenever any of us thinks of it, we try to add a few,” she says. “It could be things that are important to each of us—one friend will be like ‘Look at these gorgeous flowers.’ And someone else will be excited about their kid’s outfit.”

Don’t underestimate the value of snail mail

Natalie Rosado, a licensed mental-health counselor in Tampa, suggests going old school with handwritten letters. “They add a nostalgic and tangible element to the friendship.” Your friend might display them on their refrigerator and look that way when they need a spark of joy.

The secrets of a lifelong bond

BY JAMIE DUCHARME

THERE ARE MANY FLAVORS OF friendship. Most people have situation-specific friendships, like with gym buddies or work pals, that may come and go, as well as a handful of close friends they know deeply. But rarest of all are the true forever best friends who are there for decades on end, through jobs, moves, relationships, fights, losses, and life stages.

What makes a friendship durable enough to get to that level? Shared traits, interests, and backgrounds help, says Robin Dunbar, an evolutionary psychologist and author of *Friends: Understanding the Power of Our Most Important Relationships*. Dunbar's work suggests there are seven areas of overlap that are crucial: speaking the same language, growing up in the same area, having similar career trajectories, and sharing hobbies, viewpoints, senses of humor, and tastes in music. Every close friend pair may not have every one of these in common, but the more they share, the stronger their relationship is likely to be, Dunbar says. Despite the cliché that opposites attract, research actually suggests "we prefer people who are very similar to us," he says.

Research by Jeffrey Hall, director of the Relationships and Technology Lab at the University of Kansas, also finds that people need to spend lots of time together—at least 300 hours—to become true best friends. And, Hall says, friends who express their deepest thoughts and emotions tend to become more tightly bonded than those who keep it surface level. It's also important to express to your friend that you want them around for the long haul, says Aminatou Sow, who co-wrote the book *Big Friendship: How We Keep Each Other Close* with her friend Ann Friedman.

'Some of it is mystery and magic, and the rest of it is hard work.'

—AMINATOU SOW, CO-AUTHOR OF *BIG FRIENDSHIP*

Amy Kohn, 69, says that's the case for her and her nearly lifelong friend Madeleine Rudin, 69. "We say, 'I love you' a lot," Kohn says. "We have verbalized that we'll be there for each other forever, and that, at our age, is enormously comforting."

Part of being there forever is developing consistency. Ride-or-die friends don't necessarily have to see each other all the time, but research suggests friendship maintenance is important, Sow says. Developing shared rituals is a good way of keeping the friendship vibrant—even if it's as simple as regularly sending each other memes or scheduling a monthly check-in. Friends can also borrow rituals from the realms of family and romantic relationships: taking an annual friend vacation, celebrating life events together, even

marking a friendship anniversary. "These are small things that keep the magic alive," Sow says.

And it is indeed "magic," in Sow's view. She doesn't think science has all the answers when it comes to close friendship and why some

relationships last forever. "You don't predict who you fall in love with," romantically or platonically, she says. "Some of it is mystery and magic, and the rest of it is hard work."

There is an ineffable quality to some best friendships, Hall agrees. Research suggests it takes a lot of time to build a strong bond—"but what's very weird," he says, is that once people become best friends, they may go months or even years without talking and still pick up right where they left off. Sometimes, "once a very strong friendship has been created," Hall says, "it never really stops being that way."

Kohn and Rudin can attest to that. They lost touch for years, from their late 20s into their 30s—but all it took was one lunch date to rekindle their relationship. "We just clicked immediately again," Rudin says. "After that, it never stopped."

CAN CO-WORKERS REALLY BE FRIENDS?

BY BELINDA LUSCOMBE

Work friendships are a double-edged sword. On the one hand, work is vastly more bearable—and maybe even strays into fun—when you're pals with the people you spend time with each day. Friendship can make odious tasks tolerable and worthwhile tasks more satisfying. But friendship is about authenticity, acceptance, and agenda-free companionship; the point of work is to get things done, whether or not you like your co-workers. The two aims often come into conflict, creating awkwardness and stress. Here are some tips for being a colleague and a chum.

Acknowledge any tension. When co-worker friends disagree, they can experience "role confusion"—they're not sure if it's more important to be a good employee or a good friend. It's especially tough to be a friend and a supervisor. Experts say it's best to be up front about any tension. If you used to have lunch with your buddy and you can't do that as his boss without drawing some side-eye, don't just go cold turkey; explain it to him. And if you need to keep some information confidential, explain why.

Separate the channels. Being very overt about which mode you're in in a given moment can help mitigate confusion or hurt feelings: Are you speaking as a friend or a colleague? Try keeping all work communications on your company email and all friendly chatter on personal platforms like text or social media.

Be patient. Keep in mind that once you've divulged something to a work friend, there's no taking it back. If the relationship sours, past oversharing could damage both the friendship and your ability to do your job. One expert suggests having 10 coffee dates with a co-worker before deciding to take the friendship beyond the office. And if things do go awry with friends because of work, don't forget: they're under pressure too.

IRON

A crackdown on El Salvador's gangs made Nayib Bukele one of the world's most popular leaders. Is he going too far?

BY VERA BERGENGRUEN/SAN SALVADOR

BEFORE HE BECAME ARGUABLY THE MOST popular head of state in the world, Nayib Bukele was an adman. The President of El Salvador has branded himself the “world’s coolest dictator” and a “philosopher king,” but he is, perhaps above all, a former publicist attuned to the power of image—his own and his country’s. On the day we met in late June, at the presidential offices in San Salvador, Bukele was dressed all in black. Nine brilliant peacocks roamed the lawn outside. “A leader should be a philosopher before he is a king,” Bukele told me, reclining in a chair as the sun set over the lush jungle grounds, “rather than the typical politician who is hated by their people.”

It was Bukele’s first interview with a foreign reporter in three years. The occasion was something of a victory lap. At 43, he has remade a nation that was once the world’s murder capital, turning it into a country safer than Canada, according to Salvadoran government data. Bukele’s policy of *mano dura*—iron fist—drove an aggressive crackdown on vicious gangs that has jailed 81,000 people and led to a precipitous drop in homicides. After decades of violence, fear, and extortion, citizens can move freely in former gang-controlled “red zones,” lounge in parks, and go out at night. El Salvador now markets itself as the “land of surf, volcanoes, and coffee,” hosts international events



FIST



*President Bukele at the Casa Presidencial
in San Salvador on June 25*

PHOTOGRAPH BY CHRISTOPHER
GREGORY-RIVERA FOR TIME

like the Miss Universe pageant, and draws tourists and cryptocurrency enthusiasts to coastal enclaves like “Bitcoin Beach.” The transformation helped Bukele cruise to re-election earlier this year; his approval rating these days tops 90% according to the latest CID Gallup poll. His picture adorns key chains, mugs, and T-shirts at souvenir stands; prominent portraits of him and his wife greet visitors at the airport. As we spoke, blue-and-gold banners festooned the streets of the capital, remnants of his second inauguration three weeks earlier.

Bukele’s popularity has come in spite—or perhaps because—of his defiance of constitutional, political, and legal constraints. Since 2022, he has ruled under emergency powers that suspend key civil liberties, including due process. His security regime can make arrests without warrants, including of minors as young as 12, and hauls hundreds of suspects into mass trials. One in every 57 Salvadorans is now incarcerated—triple the rate of the U.S. and the highest in the world. Bukele’s allies have fired top judges and packed the courts with loyalists, allowing him to dodge a constitutional prohibition to run successfully for a second term—all with broad public support.

Organized political opposition has, in the President’s words, been “pulverized.” Defense attorneys, journalists, and NGOs say the government has intimidated, surveilled, or attacked them, spurring many to flee. “El Salvador’s institutions have been totally co-opted, subdued, and made obedient to the presidency,” says Celia Medrano, a Salvadoran human-rights activist.

Human-rights groups have accused Bukele’s government of abuses including arbitrary detentions, forced disappearances, and torture. Salvadoran lawyers tell TIME they have documented thousands of cases of innocent people who were caught in the dragnet with no legal recourse. Bukele appears to consider them collateral damage in a larger war, the cost of guaranteeing the safety of the nation’s 6 million people. “Go anywhere,” he dares me. “Ask the people. It will be incredibly rare to find a negative opinion in the population.” He resents foreign critics’ focus on preserving El Salvador’s fragile democratic institutions—



*Accused gang members in custody
at a maximum-security prison in
Izalco, El Salvador, in 2020*

a corrupt system that, as many see it, only allowed the gangs to flourish. “Everything in life has a cost,” Bukele says, “and the cost of being called authoritarian is too small to bother me much.”

For Bukele’s admirers, El Salvador has become a showcase for how populist authoritarianism can succeed. His second term will be a test of what happens to a state when its charismatic young leader has an overwhelming mandate to dismantle its democratic institutions in pursuit of security. The results will have sweeping implications not just for El Salvador but also the region, where political leaders are eager to replicate what many call *el milagro Bukele*—the Bukele miracle.

Whether it can be sustained is a different question. While most Salvadorans say they are satisfied with the state of the country’s democracy, 61% say they fear negative consequences if they

THE COST OF BEING CALLED AUTHORITARIAN IS TOO SMALL TO BOTHER ME MUCH.

—PRESIDENT NAYIB BUKELE

publicly express their opinions about its problems, according to a survey by Chilean firm Latinobarometro. Supporters hail Bukele as a visionary, but critics call him a millennial *caudillo*: a social-media-savvy strongman repackaged for the TikTok age. Some close to him say he worries about losing support as Salvadorans’ concerns shift from security to the economy. El Salvador remains one of the poorest countries in the western hemisphere, and Bukele has made a series of gambles that have not been well received by many foreign investors and creditors, including adopting Bitcoin as legal tender and investing some of the country’s reserves in the cryptocurrency.

Even so, others are following the Salvadoran leader’s blueprint. His name is invoked on the campaign trail from Peru to Argentina. Some of his harshest critics, including in the Biden Administration, are now courting his favor. Ecuador and Honduras are building mass prisons inspired by Bukele’s. His popularity in El Salvador may export a brand of “punitive populism” that leads other heads of state to restrict constitutional rights, especially in a region where voters are increasingly gravitating toward authoritarianism. “The international community has been paralyzed by Bukele’s popularity and his success crushing the country’s bloodthirsty gangs,” says Benjamin Gedan, director of the Wilson Center’s Latin America Program. “But we know how this story ends. And when



Salvadorans tire of Bukele, they might have no options to express their political preferences.”

THE SEEDS of El Salvador’s transformation were first planted in Nuevo Cuscatlán, a sleepy town of 8,000 people on the outskirts of the capital. It was there, in 2012, that the sharply dressed scion of a wealthy local family arrived to run for mayor. “He would come with bodyguards to give speeches,” recalls Rosa Mélida, a 62-year-old resident, standing in the shade of a corner store. “He handed out food baskets to older people and paid to fix our houses.” As Mélida and her neighbors talk about the young mayor who became their President, they wave their hands toward the sky, gesturing at the green hills above. Bukele still lives up there, in a gated community called Los Sueños: The Dreams.

Bukele grew up in San Salvador, the fifth of 10 children of Armando Bukele Kattán, an affluent businessman and imam of Palestinian descent. He attended an elite, bilingual private school, where he was shielded from the brutal civil war that devastated El Salvador during the 1980s. As the son of an outspoken Muslim cleric, he learned how to define himself as an outsider and wield snark as a weapon. In an early sign of his tendency to troll his critics, Bukele captioned himself the “class terrorist” in the high school yearbook in 1999.

Although he enrolled in college to become a lawyer, Bukele soon dropped

Bukele with new military recruits in April 2022, shortly after the “state of exception” began.

out. He ran a nightclub, a Yamaha dealership, and a political-advertising firm before deciding it was time to jump into politics himself. He decided to run for mayor of Nuevo Cuscatlán, a small town that was looking for a candidate. Bukele’s first campaign video shows a smiling 30-year-old with a starched white shirt and neatly gelled hair, promising to use his business background to transform the town into a modern “model of development.”

It was soon clear that Bukele had larger ambitions. As mayor, he donated his salary to fund high school scholarships, poured funds into construction projects, and tripled the number of security officers patrolling the streets, documenting all his exploits on YouTube. When people questioned where the money came from, he debuted what would become a trademark slogan: “There’s enough money to go around if no one steals.” (In fact, the town would go into heavy debt during his term, according to Salvadoran investigative outlet *El Faro*.) At that point, Bukele belonged to the left-wing Frente Farabundo Martí para la Liberación Nacional (FMLN) party, like his father. Yet he conspicuously shunned its traditional red colors and outdated revolutionary slogans. More than a decade later, the town’s clinic, library, and park are

still emblazoned with the peeling cyan *N* he adopted as a logo—branding that entwined Bukele’s first initial with the town’s. “He is allergic to anything that looks old or smells like your grandmother’s closet,” says a foreign diplomat who worked with him.

In 2015, Bukele ran for mayor of San Salvador and won in a close race. He continued to promote attention-grabbing public projects, including the construction of a flashy upscale market and an effort to put lights on every corner of the capital to combat crime. Bukele posted about these moves on social media, where he amassed a following that soon eclipsed that of the country’s then President. “He’s like a cinematographer,” says a former associate. “Before he even makes a decision, he’s thinking about what the end result will look like as a movie reel.” He cultivated an image of modern irreverence, often wearing a backward baseball cap, jeans, and a leather jacket. One popular image, visible on posters and magnets across El Salvador, shows him with his feet on his desk in the mayor’s office, sporting aviator sunglasses.

FMLN officials soon became wary of the young politician’s presidential ambitions. Bukele openly criticized the party’s leaders, crafting a parallel political brand with his trademark cyan symbols. His inner circle consisted of his brothers and several friends from his private-school days, all of whom have followed him into the presidency. After a series of clashes, Bukele seemed to decide he was popular enough to have outgrown the party. After one incident in 2017, in which he reportedly threw an apple at a fellow FMLN official, the group expelled him.

Within a month, Bukele had launched his own party, Nuevas Ideas, and ran in the 2019 presidential election as an antiestablishment populist. He wielded his social media machine effectively, bragging that while his opponents traveled the country he could campaign from his phone, as his media team created viral Twitter challenges and emotive ads. “It was a way to reach the population directly without going through the press filter,” he tells me. Campaigning with his pregnant wife Gabriela, a prenatal psychologist and

former ballet dancer, Bukele offered the chance of a fresh start after decades of corrupt, unpopular governments. At age 37, he won the presidency with 53% of the vote.

SOON THE MUSTY RED DRAPES and dark-paneled wood of the presidential palace were gone, replaced by gleaming cream walls with gold molding. Government social media accounts were given a facelift and began to pump out coordinated messaging. Bukele announced ambitious plans to renovate the capital's historic center and attract foreign businesses and tech investors. In his first speech before the U.N., he created a viral moment by turning around and snapping a photo: "Believe me, many more people will see that selfie than will hear this speech." The adman wanted to project a new, modern nation that was breaking with its past.

Yet El Salvador was paralyzed by entrenched violence. Its two largest gangs, Barrio 18 and Mara Salvatrucha, or MS-13, were American imports—both formed in Los Angeles in the 1980s by civil-war refugees who were eventually deported back to El Salvador. In a country tentatively emerging from that brutal conflict, the gangs grew their ranks by forcibly conscripting young people. They controlled vast territories and forced everyone—from working-class street vendors to large companies—to pay "rent," or extortion fees. They killed with impunity. Salvadorans were gunned down for not crossing the street, for looking a split second too long at someone's sister, for simply being in the wrong place at the wrong time.

Previous governments had used emergency powers to briefly instate *mano dura* in a limited way, including in the early 2000s to stem gang violence. Though popular, the crackdowns eventually backfired, driving gangs to regroup and change tactics. Like his predecessors, Bukele allegedly sought to broker a truce with the gangs. Early in his presidency, according to U.S. officials and audio recordings published by Salvadoran media, he cut deals that provided financial incentives to MS-13 and Barrio 18 "to ensure that incidents of gang violence and the number of confirmed homicides



Bukele at a campaign rally in January 2019, shortly before the first round of the national election

remained low," according to the U.S. Treasury Department, which sanctioned two Bukele associates for their involvement in 2021. (Bukele denies this.)

At the same time, he moved to consolidate power. In February 2020, Bukele entered the national parliament, flanked by armed soldiers and police in a brazen show of force, to demand lawmakers vote on new security funding. Political opponents called it an unprecedented act of intimidation. Yet Bukele succeeded in tightening his grip on the legislature, ushering in electoral reforms that cut the number of seats from 84 to 60. In May 2021, lawmakers aligned with Bukele voted to remove El Salvador's Attorney General, who had reportedly been investigating Bukele's deals with the gangs, as well as the top judges on the country's Supreme Court.

The move drew international condemnation, including from the Biden Administration. "We have deep concerns

about El Salvador's democracy," Vice President Kamala Harris tweeted. Though privately infuriated by the rebuke, according to advisers, Bukele publicly embraced the outrage. He changed his social media bio to "world's coolest dictator" and posted photos of soldiers helping civilians with the hashtag #quebonitadictadura—nice dictatorship. When international bodies raised alarms, he trolled their concerns. "Where is the dictatorship?" he tweeted when protesters demonstrating against what they saw as Bukele's unconstitutional power grab blocked the city in 2021 without government interference. "Few countries can say this: We have never repressed a demonstration," Bukele tells me, clearly angry at what he sees as foreign double standards. "We have never used a tear-gas can or a baton."

Bukele turned the controversy to his advantage. He began to tweet mostly in English, noticing "an interesting audience for our country's agenda," he says. "It was an opportunity. We found that my social media presence served as a window for investors, investment



funds, banks, important figures, and politicians.”

To market his vision of a new El Salvador, Bukele still needed a modern pitch. In September 2021, he made the nation the first to use Bitcoin as legal tender, earning global headlines and the attention of the growing cryptocurrency community. Bukele installed Bitcoin ATMs, announced plans to build a geothermal-powered “Bitcoin city,” and boasted the move would draw foreign investment and benefit Salvadorans, many of whom lacked bank accounts or internet access, let alone digital wallets. Advisers admit it was a PR stunt. “We call it the Great Rebranding. It was genius,” says Damian Merlo, a Miami-based lobbyist. “We could have paid millions to a PR firm to rebrand El Salvador. Instead, we just adopted Bitcoin.”

As policy, the gimmick has flopped. Investing some of El Salvador’s national reserves into crypto was not well received by many foreign investors or the International Monetary Fund. Today Bukele concedes that Bitcoin

“has not had the widespread adoption we hoped” among ordinary Salvadorans. Fewer than 12% have made a single transaction. But the move had the desired effect, putting El Salvador on the map for something other than its violence. “It gave us branding, it brought us investments, it brought us tourism,” says Bukele.

AMID THE BITCOIN HYPE, however, the alleged secret truce with the gangs fell apart. In March 2022, more than 87 people were murdered in a single weekend, the deadliest killing spree since the end of the civil war. One of the victims, later identified as a local surf instructor with no known gang ties, was left on the highway to Bitcoin Beach, hands and feet bound, a bullet wound in his head. It was a clear message to Bukele from the gangs, and an inflection point for the young President.

Bukele’s response was to implement a new, aggressive *mano dura*. He declared a 30-day “state of exception,” restricting free assembly and permitting arrests without warrants and detention without trial. The military surged into gang-controlled areas. Police barged into homes and strip-searched residents. Suspected gang members or collaborators were arrested at school, at work, on the street. “We were arresting more than 1,000 people per day,” says René Merino, the Defense Minister, who downplays the military’s role in the effort. “We had to do it in a way where the medicine would not be worse than the sickness.”

The police advertised a hotline to “bring more terrorists to justice.” By dialing 123, Salvadorans could anonymously report anyone they suspected of having links to gangs. In the swirling

atmosphere of fear, however, it was often hard to separate violent criminals from innocent teenagers with rock-band tattoos, or clothing or colors associated with gangs, according to local defense attorneys. Some people denounced business rivals or called in neighbors to settle petty scores. Salvadoran security forces, under pressure from superiors to meet hefty arrest quotas, were happy to carry out the often indiscriminate sweeps. “If they didn’t find the person they were looking for, they would just arrest whoever was at home,” says Alejandro Díaz Gómez, a lawyer with local human-rights group Tutela, citing videos filmed by family members. (Bukele officials say that 7,000 people have been freed owing to lack of evidence.)

The approach succeeded at curbing the rampant violence. Homicides in El Salvador dropped by half in 2022 and more than 70% in 2023, according to government data. “It was an overwhelming victory,” says Bukele. “We were fighting an irregular army of 70,000 men and suffered no civilian casualties.” Jails filled with gang members and suspected associates; the population of the country’s largest prison, designed to hold 10,000, swelled to more than three times that number.

Next Bukele built the Centro de Contenimiento del Terrorismo, or CECOT, a sprawling detention facility that could house 40,000 more inmates. In slick videos set to upbeat music, Bukele’s government advertised the prison’s spartan conditions. Meals were reduced to two a day, prisoners slept on bare metal slats, and inmates were stripped to their underwear and frog-marched through corridors. Under previous governments, “there used to be YouTube videos posted by gangs showing them in prison with prostitutes, strippers, parties, drugs,” Bukele says. The images of the brutal crackdown became an unlikely sensation, making El Salvador’s President the most-followed world leader on TikTok. He issued a public warning that if the gangs moved to retaliate, “I swear to God they won’t eat a grain of rice, and we’ll see how long they last.”

Salvadoran and international human-rights groups have accused the government of a range of abuses,

**IF THEY DIDN’T
FIND THE PERSON
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JUST ARREST WHOEVER
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—ALEJANDRO DÍAZ GÓMEZ,
HUMAN-RIGHTS ATTORNEY

including forced disappearances, torture, deaths in custody, and targeting poor and marginalized communities. Bukele scoffs at the allegations. The roughly 140 prisoners who have died in Salvadoran prisons per year during the state of exception amount to “an incredibly low mortality rate by Latin American standards,” he says, “indeed lower than the U.S.” He questions the focus on conditions in El Salvador’s prisons compared with those in notorious jails in neighboring countries. “How can I ask the Salvadoran people, who often have modest meals like beans and tortillas for dinner, to pay taxes to provide meat and chicken to prisoners who have killed their family members?” he asks.

Salvadoran officials say the punitive approach is part of the Bukele government’s appeal. “There are 660 million Latin Americans who are seeing what is possible with clear common-sense criminal procedures,” says Security Minister Gustavo Villatoro, whose office features a large screen depicting the location of every police car in the country, with different dashboards to keep track of reported crime. Villatoro says that the government “studied the enemy, like in any war.” He shows me a 90-page handbook cataloging gang tattoos, graffiti, and slang to identify suspects’ affiliations. If Bukele “hadn’t had the courage to send the hypocritical international groups to hell, we would have fallen into the same mistake that the six former Presidents made,” he says. Those predecessors had faltered in seeing through the draconian measures required to root out the gangs, Villatoro argues, whereas Bukele had persevered. “There are many priests,” Villatoro adds, “but few are exorcists.”

After his allies removed Supreme Court judges and replaced them with supporters who reinterpreted the Constitution in his favor, Bukele decided to run for a second term in spite of a pre-existing ban. In February, he won a landslide victory, with 84% of the vote. Nuevas Ideas, a party that did not exist six years ago, won 54 of the nation’s 60 congressional seats. El Salvador had effectively become a one-party state, controlled by a single man.

Bukele insists his consolidation of

power has been “100% democratic.” If other world leaders aren’t able to get such results, he argues, that’s on them: “We’re not going to artificially grant half of the Congress to the opposition just to say that we are a democracy.” Other heads of state, he suggests, would use any means necessary to achieve the transformation El Salvador has. “Their failure,” says Bukele, “can’t be our road map.”

BUKELE’S SECOND INAUGURATION in early June was a far cry from his first. A parade of high-level political figures made the trek to San Salvador, including King Felipe VI of Spain, regional leaders, more than a dozen U.S. officials and lawmakers, Donald Trump Jr., and Tucker Carlson. “It was the hottest ticket in the Americas,” says Merlo, Bukele’s U.S. lobbyist. Bukele arranged a dramatic spectacle, designing new capes for the military guard and sporting a striking suit with a stiff, gold-embroidered collar and cuffs that evoked a cross between Latin American revolutionary war heroes and *Star Wars*. Visitors were ushered into the best restaurants, shown the gleaming new Google regional offices, and taken to the renovated historic center at night to showcase the country’s safety.

Bukele casts himself as an independent operator, but he has conspicuously cultivated ties to the American right. Though he came up in a left-wing party, “the left has lost its way across the world,” says Bukele. “It has a serious identity crisis, and the right is at least setting a course.” Bukele, who speaks English fluently, has given two rare interviews to Carlson and spoken at the Heritage Foundation and Conservative Political Action Conference. His tweets use tropes common in right-wing online circles. Bukele has baselessly accused

the billionaire philanthropist George Soros of funding journalists who write critically about him, one of the reasons he says he has stopped speaking to the press. “At least state propaganda openly acknowledges it’s propaganda,” he says. “When we put out a video spot, no one’s hiding that it’s propaganda.”

In recent months, he has invited Carlson and Florida Representative Matt Gaetz to spend the weekend at his lakeside retreat, staying up into the early morning discussing everything from politics to AI, according to advisers. Gaetz, a Trump acolyte who has recently visited El Salvador several times and posed for photos at the CECOT prison, says he considers Bukele a “kindred spirit” and an inspiration to the Western world. “He sees himself as a liberator, not an authoritarian,” Gaetz tells TIME. “Sometimes, to solve third-world problems, you need some third-world solutions.”

In July, Gaetz led the launch of a bipartisan El Salvador caucus in Congress which includes several Democrats, including Representative Lou Correa of California. “Whether you agree with his methods or not, he has brought peace to his people,” Correa tells me. “His popularity among the *Salvadoreños* in my district is unbelievable,” he says. “They love the guy. My job is to work with him.”

Even the Biden Administration has softened its previous criticism. In 2021, the U.S. Treasury Department had sanctioned some of Bukele’s top officials for covert negotiations with the gangs and “multiple-ministry, multi-million dollar corruption,” and U.S. officials criticized his moves as antidemocratic. For his second inauguration, the Administration dispatched Homeland Security Secretary Alejandro Mayorkas to attend, a marker of his growing clout. It’s clear that Bukele feels vindicated. When it comes to his controversial policies, “suddenly it’s better to embrace them [...] and try not to fight against something that is too popular, not just in El Salvador but throughout all of Latin America,” he tells me.

Privately, U.S. diplomats agree. There is little to be gained by feuding with a leader with overwhelming popular support, they say. It’s more valuable to keep

‘SOMETIMES, TO SOLVE THIRD-WORLD PROBLEMS, YOU NEED SOME THIRD- WORLD SOLUTIONS.’

—FLORIDA CONGRESSMAN MATT GAETZ



A mural of Bukele's face
in the Zacamil neighborhood
of San Salvador

an open line, especially since they need El Salvador's help to stem migration to America's southern border and are seeking ways to counter Chinese influence in the region. Under Xi Jinping, China has invested \$500 million in infrastructure projects in El Salvador, including a huge futuristic library that now flies the Chinese flag in front of the country's National Palace and main cathedral.

At the same time, U.S. officials and international pro-democracy groups worry *Bukelismo* is catching on in the region. Political parties in Honduras, Ecuador, Peru, Uruguay, and Argentina have incorporated the Salvadoran President's name into their platforms and echoed his tough-on-crime language. Argentine Security Minister Patricia Bullrich recently spent four days in the country learning about the "Bukele model" and signing a cooperation agreement. Citing Bukele's example, Honduras has announced plans to build an emergency megaprison for 20,000, and Ecuadorean President Daniel Noboa has declared an unprecedented state of "internal armed conflict" to crack down on criminal gangs.

But the long-term success of the "Bukele model" is far from certain. The security gains won't guarantee long-term stability without a plan to keep the next generation from relapsing into a cycle of violence, Salvadoran officials and analysts say. Mass arrests have left more than 40,000 children without one or both parents. While military and

its GDP. Bukele needs a deal with the IMF to regain access to international markets and finance its debt, says Will Freeman, a fellow of Latin American studies at the Council on Foreign Relations. One stumbling block has been the Bitcoin gamble; another is the lack of budgetary transparency by his government, which has hidden its spending and contracting from public view. "Bukele has been very resistant to it," Freeman suggests, because it could reveal corruption. But if El Salvador is left to face a brutal fiscal adjustment on its own, he adds, "that will be the big moment when we test how deep his popularity runs."

For now, Bukele's support remains unshakable among ordinary Salvadorans, including many who have family members in prison. Anyone who did not live through the terror of life under the gangs will never understand how much things have changed, says Alvaro Rodriguez, a 39-year-old taxi driver. "Thanks to Bukele, the most dangerous thing here are these pigeons," he says, gesturing at a plaza in downtown San Salvador that citizens used to have to pay gang members to enter.

Which is why Merino, the Defense Minister, believes the government has a mandate to continue *mano dura*. "No matter how much these human-rights groups cry and complain about the state of emergency, people here are much freer than in countries where there isn't a state of exception," he says. "Once you have the support of the population, there is nothing to stop us."

No one, including Bukele, knows how El Salvador's experiment will end. While he rules out running for a third term, he knows what happens to Latin American strongmen when they leave office. Three of his predecessors have been arrested or indicted. But for the former admiral, it's all part of a narrative: Bukele the Messiah. "I used to be the safest person in the country, I had bodyguards and armored cars," he says, gesturing with his arms in our interview in his office. "Now the country has safety but I do not. I traded my security for that of the Salvadoran public." He pauses. "As I said," he adds, "everything in life has a cost." —With reporting by SIMMONE SHAH



76%

of businesses plan
to use gen AI for
new revenue

And some of them are your
competitors. It's time to think—
and act—like an AI-native business.

Read our
research



Findings based on 'New Work, New World', a report published by Cognizant in partnership with Oxford Economics, which quantifies the global momentum of generative AI.

TIME100AI



MOST INFLUENTIAL PEOPLE

IN

A R T I F I C I A L

I N T E L L I G E N C E

BY VERA BERGENGRUEN, HARRY BOOTH, CHARLIE CAMPBELL, ANDREW R. CHOW, KATHARINE GAMMON, CHAD DE GUZMAN, CAROLINE HASKINS, AYESHA JAVED, GARRISON LOVELY, TEKENDRA PARMAR, BILLY PERRIGO, THARIN PILLAY, ASTHA RAJVANSHI, YASMEEN SERHAN, AND STEPHEN THOMAS; WITH REPORTING BY LESLIE DICKSTEIN AND JULIA ZORTHIAN

ILLUSTRATION BY SEAN & EVE FOR TIME

Sundar Pichai

CEO
GOOGLE AND ALPHABET

IT'S HARD TO IMAGINE WHAT MODERN LIFE would look like without Google. Its search business prints hundreds of billions of dollars in yearly revenue. Starting over two decades ago, Google began channeling some of that money toward AI research. Its industry-leading scientists were responsible for many of the breakthroughs that drove the field to its current inflection point. And yet the product that in late 2022 kick-started today's AI boom, ChatGPT, came from a startup backed by Google's major competitor, Microsoft. Suddenly Google was no longer the symbolic leader of the AI race, but instead playing catch-up.

Google's CEO Sundar Pichai, who joined the company in 2004, took that hurdle in stride. Google wasn't the first to build a search engine, he points out, but was the first to build one good enough to attract the lion's share of the market. The same for browsers. Email. Maps. His point: it matters less whether Google is first, and more that its version is the best. The U.S. Department of Justice takes an alternative view: that Google's search is a monopoly upheld by illegal anticompetitive actions. On Aug. 5 a judge ruled in favor of that argument; Pichai says Google plans to appeal.

Facing that giant risk to its business, Google has begun to introduce generative AI tools into products with billions of users, the most visible being Google Search, where new "AI Overviews" are now appearing above the familiar 10 blue links. Pichai spoke with TIME about how the tech giant is approaching the AI future.

Google is now rolling out AI Overviews in Search, which is the front door to the internet for most people. How are you thinking about the ripple effects of that? It is one of the biggest

SUNDAR PICHAI
HAS BEEN CEO OF
GOOGLE SINCE 2015



improvements we have done in 20 years. Given that we can do this in a way that touches billions of people, we have to be very responsible in how we approach it. In the longer run, you're enabling access to knowledge and intelligence at an unprecedented scale. We have work left to do to make all of this work well. But that's the vision.

The business of journalism is built on people reaching news sites. But with AI, Google seems to be working to replace the open web. What happens to society when the business model for so many publishers is threatened? We are prioritizing approaches that value journalistic content and will send traffic to important sources. In a world where there's increasing AI-related content, people are looking for those voices.

Google recently pulled an ad for Gemini, the company's generative AI chatbot, after a backlash. [The ad featured a father asking Gemini to help his daughter write a letter to her role model.] Why do you think people didn't like it? Our goal with AI is to help you with tasks so that you have more time for the human moments to shine through. Talking to your child is one of those human moments. I think people aren't looking for help in those dimensions. That's where that [ad] got it wrong.

Investors like Goldman Sachs and Sequoia are questioning whether these huge investments in AI are going to be profitable anytime soon. Do you think we're in a bubble? I think it'll end up making sense long term. Of course, there'll be cycles, and we're all adaptable. I think we are choosing the right approach in investing to push the frontier.

There was allegedly an argument between Google co-founder Larry Page and Elon Musk, where Page argued it would be a good thing if digital life were to outcompete human life. Do you agree with Larry? I've had many conversations with the founders, and we haven't talked about it in this way. We end up talking about frustrations like why can't we make progress so that we can detect cancer better and save lives? At Google, we are working super hard to build technology in a way that empowers people, and I think that's an important framework by which we will approach everything we do. —BILLY PERRIGO

PHOTOGRAPH BY HELENN OSPINA



**Sasha
Luccioni**

AI AND CLIMATE LEAD
HUGGING FACE*

About five years ago, Sasha Luccioni was researching ways AI could help tackle climate change when a single question prompted her to rethink: What if AI was part of the problem? The tech industry, she says, has not been forthcoming with data about the carbon footprint of this new technology.

That revelation spurred Luccioni to examine AI's environmental costs. So in 2020 she helped create a tool for developers—which has since been downloaded over 1 million times—to quantify the carbon footprint of running a piece of code. Two years later, she co-authored one of the first studies to calculate the carbon generated by a large language model. The study estimated that BLOOM, which at the time was the world's largest multilingual open-source AI model, would generate over 50 metric tons of CO₂ over its life cycle.

As climate and AI lead at Hugging Face, a wildly popular platform for sharing open-source AI models, Luccioni is focused on pushing these insights beyond the research community. She is developing a first-of-its-kind “Energy Star” rating for AI. The system, set for release later this year, will help engineers and startups compare the climate impact of different AI models. The aim isn't to shun AI, Luccioni says, but to help others choose the right tool for the job.

—Harry Booth

PHOTO: ILLUSTRATIONS BY TIME / SOURCE: IMAGES COURTESY THE SUBJECT / UNLESS OTHERWISE NOTED

*INVESTORS IN THIS COMPANY INCLUDE SALESFORCE, WHERE TIME CO-CHAIR AND OWNER MARC BENIOFF IS CEO



Satya Nadella

**CEO
MICROSOFT**

Satya Nadella is leading the drive toward artificial general intelligence (AGI). In 2019, he presided over Microsoft's decision to invest its first billion in an obscure AI lab called OpenAI—which needed Microsoft's prowess in cloud computing to help in its effort to build AGI—and grew that partnership into a profit-sharing deal worth more than \$13 billion. Nadella has also proved himself to be a shrewd corporate maneuverer. When OpenAI's board briefly fired

Sam Altman in late 2023, Nadella offered all OpenAI employees jobs at his own company, neutralizing the board's threat and clearing the way for Altman's return. Since that high drama last November, Nadella has moved to reduce Microsoft's reliance on OpenAI, investing \$16 million in the rival French AI lab Mistral, and hiring a team of world-leading researchers to begin a parallel effort, inside Microsoft, to build its own large language models. —*Billy Perrigo*



Sam Altman

**CEO
OPENAI†**

Last year, Sam Altman rocketed to global fame with the success of ChatGPT. But just before Thanksgiving, OpenAI's board fired him, saying he had been dishonest with them. He eventually saw off the threat, and was back in the top job within days. In 2024, Altman shepherded OpenAI through

several new products including a voice assistant, a synthetic video generator, and an AI search engine, and sought up to \$7 trillion to build a new manufacturer of the chips necessary to build cutting-edge AI. But the scrutiny continued. Several of OpenAI's senior safety researchers have resigned

in recent months, with one claiming that under Altman's leadership, safety had "taken a backseat to shiny products." Despite the headwinds, and with a new safety committee in place, Altman does not appear to be relinquishing his spot at the front of the AI pack anytime soon. —*B.P.*

Jensen Huang

**CEO
NVIDIA**

As Nvidia's chip designs became crucial to AI, Huang guided his company to briefly become the world's most valuable, worth around \$3 trillion.

Rohit Prasad

**HEAD SCIENTIST, AGI
AMAZON**

Prasad jumped from working on Alexa to running the new Amazon AI team last year, and is leading the juggernaut in the race for AGI.

Cari Tuna

**PRESIDENT
OPEN PHILANTHROPY**

Open Philanthropy has donated over \$400 million to AI safety research since 2015, making it one of the largest philanthropic funders.

Zhuang Rongwen

**DIRECTOR
CYBERSPACE ADMINISTRATION OF CHINA**

As head of China's leading AI regulator, Zhuang has deftly balanced fostering innovation with enforcing the nation's strict censorship.



Mark Zuckerberg

**CEO
META**

Meta's Llama AI models are now some of the most powerful in the industry, and Zuckerberg, in a break from the leading labs, decided to publish the underlying neural networks online, embracing the open-source community.

Demis Hassabis

**CEO
GOOGLE DEEPMIND**

Under Hassabis' leadership, DeepMind continues to push the frontier of AI in domains including mathematics and biology.

C.C. Wei

**CHAIRMAN AND CEO
TSMC**

Wei leads the only company currently capable of fabricating the cutting-edge chips that power the most advanced AI systems.

Masayoshi Son

**CHAIRMAN AND CEO
SOFTBANK**

Son is backing AI with nearly \$9 billion a year in investments via SoftBank, and a resolve to achieve "artificial super intelligence."

Faisal Al Bannai

**SECRETARY GENERAL
ADVANCED TECHNOLOGY RESEARCH COUNCIL (ATRC)**

Al Bannai put the UAE in the AI race with 2023's open-source release of Falcon, a group of models that competes with Big Tech offerings.

Liang Rubo

**CEO
BYTEDANCE**

TikTok's parent company now runs China's most popular chatbot, Douyin, and is planning a \$2.2 billion AI hub in Malaysia.

Wang Xiaochuan

**FOUNDER
BAICHUAN**

In 2023, Chinese company Baichuan AI became one of the fastest ever to achieve unicorn status.

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Lisa Su

CEO
AMD

LISA SU IS ACUTELY AWARE THAT TECHNOLOGY is all about making the right bets. In her 10 years at the helm of chipmaker Advanced Micro Devices (AMD), she has steered one of Silicon Valley's greatest turnarounds by focusing on its strengths and strategic dealmaking. When she took over at the company in 2014, its share price was languishing around \$3. By leaning into making central processing units (CPUs) for laptops and PCs, and graphics processors, used in gaming consoles and PCs, Su brought AMD onto more stable footing, strengthening tactical partnerships with companies including Sony and Microsoft. In recent years, AMD has closed the \$49 billion purchase of competitor Xilinx—the largest semiconductor deal ever—as well as the \$1.9 billion acquisition of data-center networking company Pensando.

The company has since leaned as heavily into AI as its competitors. AMD's current generation of AI chips, the MI300—launched in January—is the company's fastest ramping product ever, passing \$1 billion in total sales in less than two quarters. The MI300X chip from the series rivals dominant AI chipmaker Nvidia's H100, and Su has called it “the most advanced AI accelerator in the industry.” In June the company announced it would be rolling out a new portfolio of chips for AI computing, including the Ryzen AI 300 series processors, the Instinct MI325X accelerator, and the MI350 graphics processing unit series.

The excitement around AI and the rise of rival Nvidia to become one of the most valuable companies in the world has prompted some, like hedge fund Elliott Management, to raise concerns that the technology is “overhyped” and even entering bubble territory. But Su dismisses this idea. “Every 10 years or so, we see a major arc in technology, whether it was the beginning of the internet, or the beginning of the PC, or the beginning



SU IS LEADING AMD'S PUSH TO INTEGRATE END-TO-END AI INTO ITS PRODUCTS

of mobile phones, or the beginning of the cloud,” Su says. “I think AI is bigger than all of them, in terms of how it can really impact our daily lives, our productivity, our business, our research—and we’re at the very beginning of the cycle.”

AMD is continuing to expand its AI footprint through acquisitions, in August announcing it was buying AI and cloud-computing data-center equipment maker ZT Systems for nearly \$5 billion. This steps up AMD’s rivalry with Nvidia, which has also bolstered its data-center offerings over the past few years. In July, AMD said it was acquiring Europe’s largest AI lab, Silo AI, in a deal worth around \$665 million. “We really believe in end-to-end AI in every aspect,” says Su. “AI is going to be throughout our entire product portfolio.”

That \$3 share price? It’s now hovering around \$150, giving AMD a market value of close to \$250 billion. The company reported second-quarter revenue of \$5.8 billion, up 9% from the previous year. Clients include Google and Amazon Web Services.

AMD has faced some challenges. Earlier this year it was reported that its Instinct MI309 chip, which was tailored to be suitable to sell to the



China market, failed to secure the green light from the U.S. Commerce Department to be exported because it was still too powerful to comply with regulations. "We certainly understand the need to protect national security from each country's perspective," Su says. "We want to ensure that we continue to be very cognizant of the export controls, but still view the rest of the world, especially as we think through all of the global users of semiconductors, including China, [as] important markets for us."

Su sees little limit to the heights AI could climb to. In the next five years, she thinks AI will dramatically accelerate research and improve the quality of health care. In her own industry, it won't be long, she says, until faster, more efficient chips themselves are designed with the help of AI. —AYESHA JAVED

'Every 10 years we see a major arc in technology. AI is bigger than all of them.'

Jonathan Ross

CEO
GROQ



Jonathan Ross had already made a name for himself at Google, designing the custom chips that the company would train its AI models on, when he founded Groq, now one of the buzziest AI chipmaking startups in Silicon Valley.

Groq's chips, called language processing units (LPUs), aren't designed for the initial AI training period. Instead, they're optimized to run large language models as fast as possible once they've been created. What distinguishes LPUs is their efficiency: 10 times the speed and one-tenth the cost to run of industry-standard graphics processing units (GPUs), according to a Groq slide deck. The ground, however, is shifting fast: Cerebras Systems

claimed on Aug. 27 that its cloud platform is twice as fast as Groq's and 20 times as fast as GPU-based rivals.

Groq was valued at \$2.8 billion at its most recent funding round, led by BlackRock. But it's still a minnow compared with Nvidia, its main competitor, which is worth around \$3 trillion. Groq's LPUs, critics point out, are faster but also less flexible than Nvidia's GPUs, which restricts its potential customer base. But Ross sees space in the market for both. "Nvidia will sell every single GPU that they make, and we will sell every LPU we make," he says. "The demand is insane." As computing gets faster, he says, AI will become ubiquitous. —BILLY PERRIGO

Victor Riparbelli

CEO
SYNTHEZIA

Deepfakes as a service: that's Synthesia's business model. But it's not what it sounds like. The London-based AI company offers businesses a platform to turn any document or web page into an engaging video hosted by a realistic AI avatar. In June, the company launched a service allowing customers to create an avatar of themselves using a laptop webcam in

as little as five minutes. "Our product is for [clients who say], 'We have a help-center article; make a quick video that explains the content,'" CEO Victor Riparbelli says.

Synthesia is also battling against the seedier ways that people are using AI-generated video—a technology that has been used to produce an epidemic of sexualized harassment of women and girls, their likenesses

superimposed onto explicit videos without their consent. Synthesia lobbied the U.K. government to ban the creation and sharing of sexually explicit deepfakes, a law that came into effect in April. On its own platform, Synthesia requires users to upload a verification video of themselves, to ensure that individuals can't make AI avatars of other people. —B.P.

Aravind Srinivas

CEO
PERPLEXITY[†]



Perplexity's tagline is "Where knowledge begins." The AI-powered search engine, launched in 2022, has been under fire from those who beg to differ. Online publishers say its business model, using AI to summarize websites while diverting ad revenue away from them, is unethical. In June, the company launched Perplexity Pages, a feature that creates AI-generated reports in response to queries. It appeared to have plagiarized reporting from multiple publications, while barely or inaccurately citing its sources, sparking cease-and-desists from Forbes, Condé Nast, and others.

In the wake of these incidents, Perplexity, which raised a round in April at a

valuation of \$1.04 billion, is highlighting its sources more prominently. "We've always cared deeply about attribution and citations in our product, and appreciate the feedback on how we can continue to refine it," a spokesperson tells TIME. Still, Perplexity's underlying business strategy remains the same—and has raised questions about the future of journalism and digital publishing in the AI age. CEO Aravind Srinivas has now grown Perplexity to "tens of millions" of users making some 230 million queries per month, according to a company spokesperson. In July, Perplexity launched a pilot program to share revenue with publishers; six, including TIME, joined. —Billy Perrigo



Daphne Koller

CEO
INSITRO

One of the most oft-dreamed applications of AI is using it to pioneer new screenings and treatments for diseases—precisely what Daphne Koller is trying to do at Insitro. The company uses machine learning tools to scan genetic samples from people with diseases like ALS, cancer, and tuberous sclerosis, then tries to identify causal mechanisms that

human researchers may have missed. Staff with backgrounds in fields like machine learning, metabolic-disease research, and statistical genetics work together to solve biological puzzles.

Insitro's research into non-alcoholic fatty liver disease, Koller says, has advanced to animal trials, and the company plans to apply for a clinical

trial for a human drug in the coming months. But six years in, Koller says it's crucial not to play into the AI-hype cycle that's so common in the tech world. "What we're doing is really hard— intervening in human biology in a way that is both safe and efficacious," Koller says. "It's important to not make extravagant promises."

—Caroline Haskins



Sarah Gurev

CO-LEAD AUTHOR
EVEscape PROJECT

In a fall 2023 paper, Gurev and her team showed that her AI tool, EVEscape, could accurately predict forthcoming COVID-19 variants before they appear.



Mustafa Suleyman

CEO
MICROSOFT AI

In March, Suleyman left his startup Inflection AI to lead Microsoft's new AI wing, sparking a merger investigation by the U.K.'s regulatory body.

Mira Murati

CTO
OPENAI[†]

Murati briefly served as OpenAI's interim CEO last December before Sam Altman's return. She's since taken a more public role and oversaw the launch of GPT-4o.

Andrew Feldman

CEO
CEREBRAS SYSTEMS

The chip startup this year released its third-generation Wafer-Scale Engine—a chip about 57 times the size of a GPU that can run large language models up to 20 times as fast.

Shiv Rao

CO-FOUNDER
ABRIDGE

Practicing cardiologist Rao leads a startup that uses AI to take notes and do paperwork for doctors, which this year signed a deal with health care giant Kaiser Permanente.

Zack Dvey-Aharon

CEO
AEYE HEALTH

Dvey-Aharon in April led AEYE Health to the FDA approval of AEYE-DS, an AI that can diagnose diabetic retinopathy via handheld camera, without doctor supervision.

Christophe Fouquet

CEO
ASML

This spring, Fouquet rose to lead the world's only producer of manufacturing equipment for advanced semiconductors, without which AI would be impossible.

**Brett Adcock****CEO FIGURE**

In January, Figure partnered with BMW to put its humanoid AI robots to work at the automaker's South Carolina plant.

Anant Vijay Singh**PRODUCT LEAD PROTON**

Singh is leading Proton's push to use AI for more privacy, with encrypted tools that challenge data-hungry tech giants.

John Jumper**DIRECTOR GOOGLE DEEPMIND**

In May, Jumper's team unveiled AlphaFold 3, a new generation of the revolutionary protein-shape prediction algorithm.

Piotr Dabkowski**CO-FOUNDER ELEVENLABS†**

With a short audio clip, ElevenLabs can clone your voice. The company has forged major audio-content deals this year.

Lawrence Lek**ARTIST, FILMMAKER**

Lek received the Frieze London 2024 Artist Award for his films, which are set in sci-fi landscapes and feature AI entities as main characters.

Silvio Savarese**CHIEF SCIENTIST SALESFORCE§**

Savarese oversaw the launch of Einstein GPT, the first customer-service chatbot that can help with more complex tasks like returns, refunds, and marketing emails.

**Arthur Mensch****CEO MISTRAL AI***

Since launching Mistrail in 2023, Mensch has made it Europe's top AI contender, forging a lucrative deal with Microsoft in exchange for cloud services.

Lina Khan**CHAIR FEDERAL TRADE COMMISSION**

In January, Khan opened an FTC inquiry into the partnerships between Silicon Valley behemoths (Google, Amazon, Microsoft) and rising AI labs (OpenAI, Anthropic), probing whether they are undermining fair competition.

Dan Neely**CEO VERMILLIO**

In January, Vermillio, which scans platforms for unauthorized use of a client's likeness or intellectual property, partnered with the talent agency WME.

Willonius Hatcher**COMEDIAN AND AI CREATOR**

As King Willonius, the comedian makes movie trailers and songs using AI. His joyous AI-created song "BBL Drizzy" went viral during the Drake-Kendrick Lamar feud.

Palmer Luckey**FOUNDER ANDURIL INDUSTRIES**

Luckey, who previously created Oculus VR, has a new startup with a wider reach. Anduril makes AI weapons and defense systems used by militaries around the world, including in Ukraine.

**Tekedra Mawakana****CO-CEO WAYMO**

Under Mawakana, Waymo was the first company to put AI-driven taxis in major metropolitan areas: San Francisco, Phoenix, and this year the largest yet—Los Angeles. Austin is next. The potential liability is huge, but Mawakana is convinced AI can make roads safer. Last year, the company published 20 safety papers, including data showing their AI "drivers" had 85% fewer crashes involving injuries than human drivers did on the same roads.

—Katharine Gammon

**Chris Mansi****CO-FOUNDER VIZ.AI**

When someone is having a stroke, they lose 2 million brain cells a minute, leading to increasing disability. Mansi, a neurosurgeon, co-founded Viz.ai, which analyzes a patient's tests and scans to help diagnose stroke and other emergencies; the company says it can already shave 66 minutes off the time it takes for stroke patients to receive specialized care. Its algorithm was the first of its kind to be FDA approved in 2018, and is now used in 1,600 hospitals. A dozen more have since been approved, as the company continues to grow the list of conditions it can detect.

—Harry Booth

Ray Kurzweil

PRINCIPAL RESEARCHER AND AI VISIONARY
GOOGLE

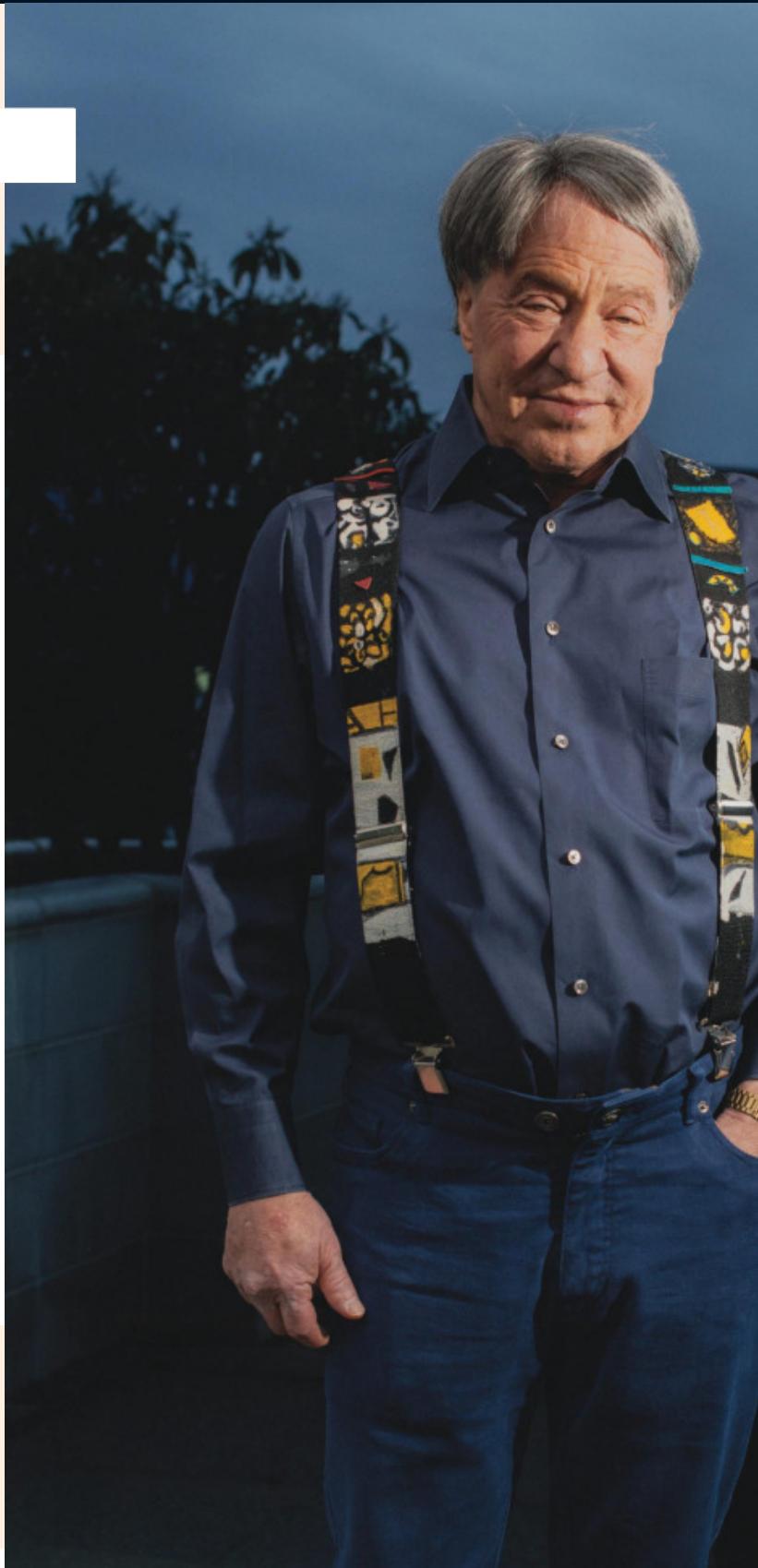
RAY KURZWEIL'S EERILY PRECISENT PREDICTIONS about AI are underpinned by a simple line chart. The chart, tracking the amount of computing power you could buy for a dollar over time, has grown exponentially for the past 85 years. Kurzweil initially used it to prioritize his inventions as a young programmer, focusing on a revolutionary print-to-speech machine for the blind in the 1970s, then early speech-recognition software in the '80s. Eventually, he started writing about what he believed advances in computing power would bring, and his predicting "took on a life of its own."

In 1990, Kurzweil correctly projected that AI would beat the best human player at chess before the turn of the millennium, and that mobile devices connected to a global information network would emerge in the decade that followed. In 1999, he forecast that by 2029, computers would match human intelligence in every domain. At the time, leading researchers like Geoffrey Hinton and Yoshua Bengio thought it would take much longer. They have since changed their tune.

Six decades into his career, Kurzweil still devotes his days to pondering the technology, on his own and, since 2012, as principal researcher and "AI visionary" at Google. His books, like *The Singularity Is Near*, have become sacred texts, inspiring many now leading the field—including DeepMind co-founder Shane Legg and top researcher at Anthropic Jan Leike—to dedicate their careers to AI.

So of course the industry turns to Kurzweil with questions about what it means that we could be years, not decades, away from human-level AI. If you ask, Kurzweil will comfort you. We haven't encountered any risks that would "doom humanity," he says. He acknowledges that technology presents dangers—the same drone that can carry

KURZWEIL HAS
FORECAST AI
FOR DECADES





medicine could also carry a bomb—but maintains that they are far outweighed by the rewards.

Of all the benefits, the prospect of AI-driven medical advances is what seems to most inspire the now 76-year-old Kurzweil, who has long aspired to live forever. For every year you age, he argues, scientific advancements in longevity research give you about four months back. As scientific progress accelerates thanks to AI, eventually you'll get more than 12 months back each year, so that, in principle, humans would live forever. This is what Kurzweil calls "longevity escape velocity." He reportedly takes 80 pills a day to give himself the best chance of riding this technological wave.

In his latest book, *The Singularity Is Nearer*, released in June, Kurzweil cites developments like AI drug discovery and ChatGPT as indicators that human-level intelligence is around the corner. The inevitable destination, Kurzweil believes, is "the singularity"—a moment when humans merge with AI via brain-to-computer interfaces to become "much smarter." The term *singularity* comes from physics, to describe the point at which space-time collapses on itself and the laws of physics—or, in this case, what it means to be human—break down. Kurzweil personally reckons that the AI singularity will happen around 2045, a prediction he outlined in a 2011 TIME cover story titled "2045: The Year Man Becomes Immortal." (Of note: Elon Musk's Neuralink began human trials on its brain implants this year.)

"You can certainly talk about problems that come with intelligence," Kurzweil says. But "I doubt we'd want to go back to the intelligence of a lesser animal."

The man Bill Gates has called "the best person I know at predicting the future of artificial intelligence" has been wrong before; he once forecast that speech-to-text would dominate writing by 2009. But Kurzweil's preoccupations with longevity and technological forecasting have become mainstays of the various AI subcultures, from starry-eyed optimists to apocalyptic doomsayers. In time, Kurzweil says, even skeptics will begin to see the world through his lens. "Not that I would wish catastrophic medical problems on anybody, but people who are against AI will get problems that are unsolvable," he says, "and AI will come up with a solution." —HARRY BOOTH

SUTSKEVER: JACK GUEZ—AFP/GETTY IMAGES



Ilya Sutskever

**CO-FOUNDER
SAFE SUPERINTELLIGENCE**

OpenAI's former chief scientist has had a tumultuous year. Ilya Sutskever, once widely regarded as one of the most brilliant minds at OpenAI, voted in his capacity as a board member last November to remove Sam Altman as CEO. The move was unsuccessful, in part because Sutskever reportedly reversed his vote. After that, Sutskever disappeared from OpenAI's offices so noticeably that memes began circulating online asking what had happened to him. Finally, in May, Sutskever announced he had stepped down from the company.

On X, Sutskever said he believed OpenAI would build AGI safely. But his departure came at the same time several other safety-focused staff members left with more pessimistic public statements about OpenAI's safety culture, encouraging the impression that something fundamental had shifted at the company. In June, Sutskever announced he was starting a new AI company, called Safe Superintelligence, which aims to build advanced AI outside of the market, to avoid becoming "stuck in a competitive rat race."

Safe Superintelligence is now at least the third AI company—after OpenAI and Anthropic—to be founded by industry insiders in the belief that they could build superintelligent AI more safely than their irresponsible competitors. But so far at least, with each new entrant, the race has only accelerated.

—Billy Perrigo



Albert Gu

ASSISTANT PROFESSOR
CARNEGIE MELLON
UNIVERSITY

Albert Gu is working on giving artificial intelligence something akin to memory.

Currently, every time you ask a large language model (LLM) like ChatGPT a question, it considers every prior bit of information the user has provided before generating a response. This contributes to the lag users experience when chatting with the AI. Gu, who is also a co-founder of the AI startup Cartesia, has developed a new way of designing models that allows the AI to compress every prior data point into a “summary of everything [it has] seen before,” he says. The design, called Mamba and described in a paper published in December, gives models something like a working memory, potentially making them faster and much more efficient with computing power. Tech-industry headlines were quickly abuzz about the speed and skill of Mamba, and researchers—including a group from Microsoft—issued follow-up studies with twists on the design. Abu Dhabi’s Technology Innovation Institute (TII) has successfully implemented the Mamba architecture in its open-source Falcon Mamba 7B model.

Gu spent five years working on the approach alongside Princeton assistant professor Tri Dao and others, and believes the work shows there are many paths the development of AI could follow. “Even just the proof of concept that there are companies who have scaled these models—really good models—based on these alternate architectures offers an important signal to open-source and academic communities,” Gu says. —Tharin Pillay

Andrej Karpathy

FOUNDER
EUREKA LABS

The OpenAI co-founder has become one of the world's foremost educators on AI, from teaching at Stanford to GPT tutorials on YouTube.

Andrew Yao

DEAN
TSINGHUA UNIVERSITY

A renowned computer scientist, Yao has for decades shaped minds through his classes at Tsinghua University.

Iason Gabriel

RESEARCH SCIENTIST
GOOGLE DEEPMIND

As AIs get more autonomous, DeepMind’s resident philosopher argues, their makers must tread carefully to prevent users from getting hurt.

Helen Toner

EX-BOARD MEMBER
OPENAI[†]

In November 2023, Toner voted to fire Sam Altman as OpenAI’s CEO, ultimately resulting in her own ouster. She now advises lawmakers on how best to regulate AI labs, which she thinks need it.

Amanda Askell

MEMBER OF
TECHNICAL STAFF
ANTHROPIC^{*}

Askell, nicknamed the Claude Whisperer, has crafted the chatbot’s persona “to have a nuanced, rich conception of what it is to be good,” she says.

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Jan Leike

ALIGNMENT SCIENCE
CO-LEAD
ANTHROPIC^{*}

Leike quit OpenAI in May, claiming publicly that the company didn’t prioritize safety. He continues his work at rival Anthropic.

Chris Olah

CO-FOUNDER
ANTHROPIC^{*}

In May, Olah’s team discovered a way to identify neuron groups representing concepts in a neural network, and that toggling them on or off could change its behavior.



Beth Barnes

FOUNDER
METR

Barnes’ nonprofit METR works to stress-test AI models. Last year, one experiment showed that OpenAI’s GPT-4 could purposely deceive users.

Ben Zhao

INVENTOR
NIGHTSHADE

Zhao’s tool Nightshade, which makes artwork unrecognizable to AI, has been downloaded roughly a million times since 2023.

Geoffrey Irving

RESEARCH DIRECTOR
U.K. AI SAFETY INSTITUTE

Irving works at the U.K. AISI to develop plans for how to detect—and respond—if new AI models become dangerous.

Katja Grace

CO-FOUNDER
AI IMPACTS

In January, Grace’s organization surveyed 2,700 AI researchers and found many think AI may outsmart humans by 2027.

Chinasa T. Okolo

FELLOW
THE BROOKINGS
INSTITUTION

Okolo is a powerful voice for AI policy in the Global South, advising the African Union’s AI strategies.

**Amba Kak**

**CO-EXECUTIVE DIRECTOR
AI NOW INSTITUTE**

Kak is a leading critic of the AI industry, advising politicians in the U.S. and Europe on regulations.

**Ethan Mollick**

**PROFESSOR
THE WHARTON SCHOOL**

Mollick's 2024 book, *Co-Intelligence*, and popular newsletter, One Useful Thing, help the average person get better at using AI.

Patrick Lewis

**DIRECTOR OF MACHINE LEARNING
COHERE**

Lewis helped pioneer retrieval augmented generation (RAG), which gives AI deeper knowledge and is used across Big Tech.

Becky Pringle

**PRESIDENT
NATIONAL EDUCATION ASSOCIATION**

Few parts of society have been impacted by AI more than education. Pringle leads the largest teachers' union in the U.S., and convened a task force that issued guidance on responsible classroom AI use.

Dwarkesh Patel

**HOST
DWARKESH PODCAST**

Patel, 23, used deep research and a podcast mic to gain access to and praise from the top leaders in AI, including Mark Zuckerberg and Demis Hassabis.

Yoshua Bengio

**FOUNDER
MILA—QUEBEC AI INSTITUTE**

One of the godfathers of AI, Bengio was appointed in November to chair the first International Scientific Report on the Safety of Advanced AI, to make official the risks.

Daniel Kokotajlo

**FORMER RESEARCHER
OPENAI[†]**

Kokotajlo made headlines this year by resigning from OpenAI and potentially sacrificing nearly \$2 million in equity by refusing to sign a nondisparagement clause, so he could speak about issues at the company.

**Marques Brownlee**

YOUTUBER

There's a joke that if you want to sell a new product, just say it's AI-powered. But YouTube tech reviewer Marques Brownlee has been careful not to get swept up in the hype. gets, complaining about "brutally bad" battery life and half-baked features to his audience of 19 million. The reviews sparked criticism that Brownlee was using his power to break down a startup, but he says being honest with his audience is key. "These companies already know about these downsides," Brownlee says.

In early 2024, after the release of the Humane Ai Pin and Rabbit r1, AI-fueled products that sought to rethink the smartphone, Brownlee became one of the loudest voices to pan the new gadget. "You could say I'm accelerating what-

ever is already happening."

As a content creator, he knows some tech companies have been siphoning videos like his to train their models, which is against YouTube's terms of service. "I don't love it because it feels like I'm donating this material against my will," Brownlee says. He would like to see creators compensated by AI developers for use of their videos, similar to YouTube's creator model.

—Harry Booth

Amandeep Singh Gill

SECRETARY-GENERAL'S ENVOY ON TECHNOLOGY
UNITED NATIONS

AMANDEEP SINGH GILL SEES THIS MOMENT as the world's narrow shot to avoid another Cold War-style arms race with AI. "In the mid-1950s—the London talks, when [Dwight] Eisenhower was the President and [Nikolai] Bulganin was the leader on the Soviet side—there was a very interesting opportunity that was missed to prevent an arms race that took off. Then you had the Cuban missile crisis, and the world came close to the brink of nuclear war," he says. "Why not be more thoughtful about this today?"

As the U.N. Secretary-General's envoy on technology, Gill coordinates digital cooperation among member states, industry, and civil society. He also helps stakeholders understand what is going on with the technology. In October 2023, the U.N. formed a 39-member High-Level Advisory Body on Artificial Intelligence, including OpenAI's Mira Murati, assistant professor Linghan Zhang (who has been leading China's AI policy response), and Gill.

In December, the body put out an interim report that laid the foundations for how to govern the proliferation of AI globally. Its key recommendations included bridging the gap between AI adoption in the West and the Global South, and producing unbiased scientific reports on AI's progress, similar to the work of the Intergovernmental Panel on Climate Change. The advisory panel's final report is expected by September, when the U.N. will hold a Summit of the Future.

Gill has said that without deliberate effort, AI will not advance the U.N.'s Sustainable Development Goals, which include ending poverty and reducing inequality, nor will it be useful in addressing climate change or public-health challenges. TIME spoke with Gill in July to understand how he's thinking about the future of global AI governance. (The interview has been condensed and edited for clarity.)



GILL AT A
NEW YORK CITY
CONFERENCE
IN SEPTEMBER
2022

One of the central problems in AI governance seems to be that the technology develops at a much quicker rate than governance responds. How do you think about this challenge? It is indeed one of the biggest challenges. When you are confronted with these technologies, the traditional tool kit falls short. So how do you respond? By updating the tool kit and by better leveraging a mix of soft and hard norms. In the AI context, we have norms around human rights, on gender, on sustainability. But if these commitments are only voluntary, then the accountability gap increases.

You need to have almost constant software re-boots. You need to update your understanding of what the technology is and what its implications are. So this proposal of a new international

scientific panel on AI—which would provide regular, unbiased assessments of AI development and its impacts—is part of that response.

We have to find ways to engage with those who are in the know. Often there's a gap between technology developers and regulators, particularly when the private sector is in the lead. You need to have a shared understanding.

How can countries in the Global South benefit from the AI revolution without being left behind? The most important thing is inclusion in governance. We need to bring in more diverse perspectives, particularly from the Global South, so their needs can be reflected—so it's not someone deciding "This is good for you. Please take it."

Second, we need to be more deliberate about capacity building. That includes curating datasets, building the cross-domain talent, access to computing power, and increasing the quantity and flow of data through digital public infrastructure and in the digital economy overall. At the end of the day, you'll have to train your own or tune your own models on local languages.

In a recent podcast appearance, you told listeners “there’s a narrow window of opportunity to avoid a cold war on AI.” What did you mean?

Today, you have a reasonable degree of optimism about international cooperation. There will be an attempted reboot of multilateralism through the upcoming Summit of the Future. Countries have an opportunity to make a decision on some aspects of AI on which we will work together. If we do this, then there is less of a chance of geopolitical competition, a race to the bottom, in terms of AI use. The job will not be done by adopting the Global Digital Compact [a statement of shared ideals, proposed by the U.N. Secretary-General in 2021, which is an agenda item at the summit], but it will be a shared foundation for future cooperative action.

These summits have often been criticized for being too numerous, but they are channels of communication. There's going to be geopolitical competition, which will include AI. But I think the point is, can we balance that competition with some cooperation? So that there's no runaway competition and it doesn't end up being a Cold War type of situation? —THARIN PILLAY

'We have to find ways to engage with those who are in the know.'

GILL JENNIFER GRAYLOCK—ALAMY

Francesca Mani

STUDENT AND ANTI-DEEPMODEL ACTIVIST



Last October, 15-year-old New Jersey high school student Francesca Mani discovered that boys in her class had used AI software to fabricate sexually explicit images of Mani and her female classmates. "We had zero protection whatsoever," she says.

Since AI image-generation tools have become widely accessible, the number of sexually explicit deepfakes circulating the web has sharply increased. Watchdog agencies now warn that images of child sexual abuse could flood the internet if controls aren't placed over AI tools.

Mani began speaking out about her experience, and soon received many letters from other girls saying they had been similarly targeted. "We all had

three things in common," Mani says, "the lack of AI school policies, the lack of laws, and the disregard of consent." So over the past year, Mani and her mother Dorota Mani have been crisscrossing the country, advocating for change. Mani spoke at a Senate hearing to support Ted Cruz's "Take It Down" bill, which aims to force websites to remove explicit images and make publishing such content a federal crime. (Similar bills have been passed in New York and Virginia.)

Mani is also working on a nationwide campaign to lobby for local-level deepfake-abuse policies. "We need to start with AI school policies, because this is where most of the targeting is happening," she says. —Andrew R. Chow

Thierry Breton

COMMISSIONER FOR INTERNAL MARKET
EUROPEAN UNION

Few European leaders have spent more time thinking about the risks and opportunities posed by AI than Thierry Breton. Decades before he was tasked with facilitating the passage of the European Union's Artificial Intelligence Act—the world's first AI law, and the most comprehensive to date—he was a computer scientist turned sci-fi writer whose 1980s novels delved presciently

into topics like fake news and generative AI. That foresight, paired with his experience as a tech and telecom executive and France's Minister of the Economy, Finance, and Industry, made Breton uniquely equipped to deal with the laborious negotiation process behind the AI Act—one that involved years of engagement with governments, tech companies, and researchers

on issues as wide-ranging as transparency, data privacy, and misinformation.

The outcome is legislation that Breton says seeks to balance the quest for innovation with the European public's best interest. "It's our mission to make sure that in any spaces where our fellow citizens live, we [politicians] provide security," Breton says. —Yasmeen Serhan

Yasir Al-Rumayyan

**GOVERNOR
SAUDI PUBLIC INVESTMENT FUND**



Saudi Arabia's Public Investment Fund (PIF) reportedly plans to create a \$40 billion fund for investing in AI, potentially in collaboration with venture-capital firm Andreessen Horowitz. The proposed fund would transform the country into one of the largest state funders of AI. The move came a month after the PIF's announcement of a new \$100 million fund for semiconductors, as the country seeks to diversify its economy from oil.

"We are fairly well positioned to be an AI hub outside of the U.S.," PIF governor Yasir Al-Rumayyan said in February, citing the country's funding capacity and energy resources. Al-Rumayyan, a close ally of Crown Prince

Mohammed bin Salman, has spent almost a decade pushing the fund into tech, but relationships between tech executives and the fund soured after a controversial anticorruption crackdown that targeted the country's elites in 2017, and the murder of journalist Jamal Khashoggi in 2018.

Now the AI boom is fueling a shift back toward the PIF. In late 2023, OpenAI CEO Sam Altman reportedly met with the PIF seeking investment for a new AI-chip venture. And years after negotiations seemingly cooled, Amazon made a dramatic re-entry into Saudi Arabia's tech landscape in March, pledging \$5.3 billion to build data centers there. —Harry Booth



Gina Raimondo

**SECRETARY OF COMMERCE
U.S.**

In the absence of federal regulation, America's AI governance has been set by President Biden's October 2023 Executive Order on AI, a document that makes Raimondo's department central to U.S. AI policy. Under her leadership, the Biden-Harris Administration secured voluntary commitments from AI companies on issues of safety, security,

and public trust. Raimondo also helped set up the U.S. AI Safety Institute and collaboration with its British counterpart.

Raimondo now oversees the disbursement of billions of dollars in funding to boost America's capacity to manufacture semiconductors, and has restricted their export to China; she recently said that America is on track to produce

20% of the global chip supply by 2030, up from 0% today.

"If technology this powerful gets into the wrong hands, I worry a lot," Raimondo tells TIME, citing cybercrime and bioterrorism as real concerns. "The best way to protect our national security is to make sure that the U.S. always maintains our lead."

—Tharin Pillay

Arati Prabhakar

**DIRECTOR
U.S. OFFICE OF SCIENCE
AND TECH POLICY**

Prabhakar is credited with demoing ChatGPT for President Biden, sparking the Executive Order on AI in October that outlined responsible development.



Meredith Stiehm

**PRESIDENT
WRITERS GUILD OF
AMERICA WEST**

During the 2023 Hollywood writers'-strike negotiations, Stiehm fought for, and won, precedent-setting protections for writers against AI.

Matt Topic

**PARTNER
LOEY & LOEY**

Topic filed a potentially precedent-setting lawsuit against OpenAI in February for alleged copyright violations against a group of digital newsrooms.

Mophat Okinyi

**CHAIRPERSON
CONTENT
MODERATORS UNION**

This year, Okinyi founded Techworker Community Africa, an NGO that educates African AI workers about their rights and advocates for better wages in the industry.

Elizabeth Kelly

**DIRECTOR
U.S. AI SAFETY INSTITUTE**

Kelly, a lead drafter of President Biden's AI Executive Order, was appointed in February to lead America's new AI Safety Institute and address the tech's risks.

Divya Siddarth and Saffron Huang

**CO-FOUNDERS
COLLECTIVE
INTELLIGENCE PROJECT**

In 2023, Siddarth and Huang collaborated with Anthropic on a study of the values everyday people think AI should hold. The findings made a version of AI model Claude less biased without affecting performance.

Ashwini Vaishnaw

**MINISTER OF
ELECTRONICS AND I.T.
INDIA**

Vaishnaw is leading efforts by India—the world's fifth largest economy—to become a player in AI, with a \$1.2 billion investment in the sector and plans for new semiconductor factories.

Nat Friedman

**INVESTOR AND
ENTREPRENEUR**

Friedman in 2023 spearheaded the Vesuvius Challenge, a contest to decode Roman scrolls buried when the volcano erupted, using AI. It was successful, revealing ancient writings.



Scarlett Johansson

ACTOR

Eleven years after voicing an AI assistant in *Her*, Johansson claimed in May that OpenAI had purposefully used a voice eerily similar to hers for its new chatbot without her consent. The incident provoked a fierce backlash against OpenAI, which denied doing so but pulled the voice.

Jade Leung

CHIEF TECHNOLOGY OFFICER
U.K. AI SAFETY INSTITUTE

In October, Leung left OpenAI to help the U.K. test whether new AI models could be used to facilitate cyber, biological, or chemical attacks.

Scott Wiener

STATE SENATOR
CALIFORNIA

In February, Wiener sparked industry ire with SB 1047, a bill mandating safety measures for developers of next-generation AI models.

Martin Heinrich

U.S. SENATOR
NEW MEXICO

Heinrich is one of the U.S.'s leading AI-focused legislators. He and the Senate AI Working Group released a road map for AI policy this year.

Dario Amodei

CEO
ANTHROPIC*

Under Amodei, Anthropic not only released one of the most powerful public AIs—Claude 3.5—but also led the way in implementing pretraining safety measures, which were later imitated by OpenAI and DeepMind.



Sara Hooker

VP, RESEARCH
COHERE*

As head of the non-profit research arm of AI startup Cohere, Hooker has worked to bring diverse researchers into the field, including through a project to build a multilingual language model.

Sheik Tahnoun bin Zayed Al Nahyan

NATIONAL SECURITY ADVISER, UAE
CHAIR, G42

Sheik Tahnoun funnels billions of dollars into the Gulf state's AI ventures, including tech titan G42, which recently secured a \$1.5 billion deal with Microsoft.

Nandan Nilekani

CO-FOUNDER
INFOSYS

The billionaire started the Adbhut India initiative to enhance AI access across the country and develop datasets in numerous Indian languages.

Kristen DiCerbo

CHIEF LEARNING OFFICER
KHAN ACADEMY

Khan Academy's AI tutor and teaching assistant, Khanmigo, aims to offer comprehensive support to students, teachers, and parents. It is free for teachers in 49 countries.



Eric Schmidt

FOUNDER
SCHMIDT FUTURES

Eric Schmidt has emerged as one of the most influential voices on AI policy in Washington, strengthening ties between Silicon Valley and the U.S. government, particularly the Pentagon. Schmidt was Google's CEO from 2001 to 2011, and now—backed by a fortune of over \$20 billion—believes the U.S. needs an "Apollo program for the age of AI" to win the tech race against China. He is a top investor in Ukrainian military accelerator D3 (Dare to Defend Democracy), and in January it was reported that he'd launched a startup to develop AI-powered "kamikaze" drones. —Vera Bergengruen



Zhang Linghan

PROFESSOR
CHINA UNIVERSITY OF POLITICAL SCIENCE AND LAW

In March, China circulated a draft comprehensive AI law, whose lead author was Zhang Linghan. Zhang is an expert member of China's Ministries of Public Security and of Industry and IT, and sits on the U.N. High-Level Advisory Body on AI. She has been outspoken about the need to regulate AI in military applications and also for all nations—large and small—to have a say in setting global AI standards, on which she says the U.N. must take the lead.

—Charlie Campbell



Anil Kapoor

ACTOR

Around the same time that SAG-AFTRA members were fighting Hollywood studios over the use of their AI replicas without consent and compensation, one of India's most famous actors was fighting a similar battle. Anil Kapoor, who starred in the Oscar-winning movie *Slumdog Millionaire* and many Bollywood films, won a landmark victory in a New Delhi high court in September over unauthorized AI use of his likeness. "Every actor has the right to protect themselves," Kapoor told *Variety* at the time.

The actor took up the case after distorted videos, GIFs, and emojis bearing his likeness began circulating online. The court ruled in his favor by restraining the 16 defendants from using, in any manner, "Anil Kapoor's name, likeness, image, voice or any other aspect of his persona to create any merchandise, ringtones ... either for monetary gain or otherwise."

Kapoor's ruling came as the Bollywood industry—one of the world's largest film industries, with more than 1,500 movies a year—grapples with the misuse of AI. Last year, deepfake videos of Indian actors Alia Bhatt and Rashmika Mandanna went viral, while AI-generated videos of actors Aamir Khan and Ranveer Singh appearing to criticize Indian Prime Minister Narendra Modi alarmed the country during this year's Indian election. Now Kapoor's case has paved the way for another victory: in July, the Bombay High Court granted interim relief to singer Arijit Singh, after unauthorized AI platforms mimicked his name, likeness, and voice without consent.

—Astha Rajvanshi

KAPOOR: RAJU SHINDE—HINDUSTAN TIMES/GETTY IMAGES; CARDELL: BETTY LAURA ZAPATA—BLOOMBERG/GETTY IMAGES

François Chollet

SOFTWARE ENGINEER GOOGLE

In June, Chollet launched the \$1.1 million ARC Prize, a competition that pushed developers further toward AGI.



Steve Huffman

CEO REDDIT

In 2024, Huffman forged lucrative partnerships with Google and OpenAI to allow their LLMs to train on Reddit's trove of user-generated content.

John Giannandrea

SVP OF MACHINE LEARNING AND AI STRATEGY APPLE

Apple had taken a back seat on AI, but Giannandrea's initiatives this year to integrate ChatGPT into Siri and extend "Apple Intelligence" for free will bring AI to millions of Apple devices this fall.

Matt Clifford

VICE CHAIR OF ADVISORY BOARD U.K. AI SAFETY INSTITUTE

In 2023, Clifford helped design the U.K.'s AI Safety Institute, a first-of-its-kind government body to lead AI-safety research that has since been emulated by the U.S., Singapore, and Japan.



Sarah Cardell

CHIEF EXECUTIVE U.K. COMPETITION AND MARKETS AUTHORITY (CMA)

Under Cardell, the CMA has sought to ensure the AI market promotes competition and protects consumers, publishing principles for fair competition and investigating major partnerships.

Tania Rodríguez

FOUNDING ACTIVIST MOSACAT

Environmental group Mosacat persuaded Google to use air cooling instead of water at an AI data center in drought-ridden Santiago, Chile, and inspired similar activism in Uruguay.

Peter-Lucas Jones

CEO TE HIKU MEDIA

In New Zealand, Te Hiku Media built its own automatic speech-recognition model for the Indigenous te reo language. The model now transcribes te reo with 92% accuracy, outperforming attempts by major tech companies.

Vinod Khosla

FOUNDER KHOSLA VENTURES

Khosla has placed big bets on AI startups—including \$50 million on OpenAI in 2019—and has become a major funder of innovators pushing the field forward.

Kyogu Lee

CEO SUPERTONE

In June, Supertone unveiled a virtual AI K-pop group called SYNDI8, powered by the company's vocal AI and signed to BTS's label HYBE.

Endang Aminudin Aziz

HEAD OF LANGUAGE DEVELOPMENT INDONESIA MINISTRY OF EDUCATION AND CULTURE

Aminudin's agency is using datasets and LLMs to try to save Indonesia's more than 700 languages.

Kauna Malgwi

NIGERIA CHAIR CONTENT MODERATORS UNION

After her own harrowing time as a content moderator in Kenya, Malgwi now fights for fair rights for moderators and other AI data workers.

TIME

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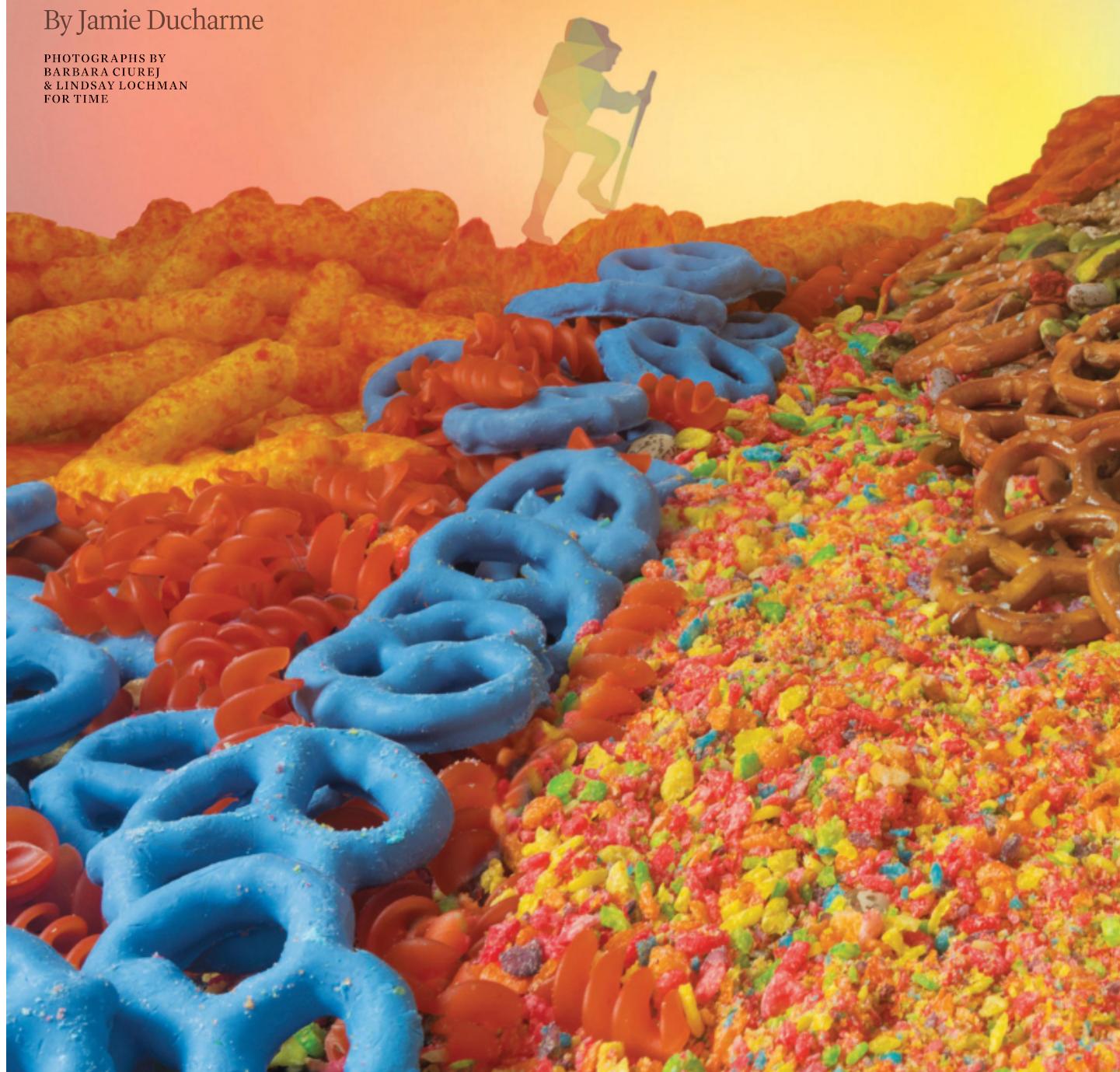
A photograph showing a tablet displaying a news article from TIME.com. The article is titled "Mistral AI CEO Arthur Mensch on Microsoft, Regulation, and Europe's AI Ecosystem". Below the title is a large photo of Arthur Mensch sitting on a red couch. The tablet is placed next to a white cup of coffee, an open notebook with a pen, and a small potted plant, all resting on a dark blue surface.

STILL PROCESSING

Not all ultra-processed foods are the same.
Or, some argue,
even unhealthy

By Jamie Ducharme

PHOTOGRAPHS BY
BARBARA CIUREJ
& LINDSAY LOCHMAN
FOR TIME





JESSICA WILSON IS PASSIONATE ABOUT THE PUPUSAS FROM COSTCO.

Not just because they're tasty, but also because they've helped the California-based registered dietitian fight back against the mounting war on ultra-processed foods.

It all started in the summer of 2023, when author and infectious-disease physician Dr. Chris van Tulleken was promoting his book, *Ultra-Processed People*. While writing it, van Tulleken spent a month eating mostly foods like chips, soda, bagged bread, frozen food, and cereal. "What happened to me is exactly what the research says would happen to everyone," van Tulleken says: he felt worse, he gained weight, his hormone levels went crazy, and before-and-after MRI scans showed signs of changes in his brain. As van Tulleken saw it, the experiment highlighted the "terrible emergency" of society's love affair with ultra-processed foods.

Wilson, who specializes in working with clients from marginalized groups, was irked. She felt that van Tulleken's experiment was oversensationalized and that the news coverage of it shamed people who regularly eat processed foods—in other words, the vast majority of Americans, particularly the millions who are food insecure or have limited access to fresh food; they also tend to be lower income and people of color. Wilson felt the buzz ignored this "food apartheid," as well as the massive diversity of foods that can be considered ultra-processed: a category that includes everything from vegan meat replacements and nondairy milks to potato chips and candy. "How can this entire category of foods be something we're supposed to avoid?" Wilson wondered.

So she did her own experiment. Like van Tulleken, Wilson for a month got

80% of her daily calories from highly processed foods, not much more than the average American. She swapped her morning eggs for soy chorizo and replaced her thrown-together lunches—sometimes as simple as beans with avocado and hot sauce—with Trader Joe's ready-to-eat tamales. She snacked on cashew-milk yogurt with jam. For dinner she'd have one of her beloved Costco pupusas, or maybe chicken sausage with veggies and Tater-Tots. She wasn't subsisting on Fritos, but these were also decidedly not whole foods.

A weird thing happened. Wilson found that she had more energy and less anxiety. She didn't need as much coffee to get through the day and felt more motivated. She felt better eating an ultra-processed diet than she had before, a change she attributes to taking in more calories by eating full meals, instead of haphazard combinations of whole-food ingredients.

How could two people eating the same type of foods have such different experiences? And could it be true that not all ultra-processed foods deserve their bad reputation?

These hotly debated questions come at a crucial moment. In 2025, the U.S. government will release an updated version of the Dietary Guidelines for Americans, which tell people what they should eat and policymakers how to shape things like school lunches and SNAP education programs. The new edition may include, for the first time, guidance on ultra-processed foods. Officials at the U.S. Food and Drug Administration are also reportedly weighing new regulatory approaches for these products.

The food industry, predictably, maintains that ultra-processed foods

have been unfairly demonized and can be part of a healthy diet. Likely sensing a threat to their bottom line, large food companies have reportedly already started lobbying against recommendations around processed-food consumption.

What's more surprising is that even one dietitian would take their side, defending a group of foods that, according to 2024 research, has been linked to dozens of poor health outcomes ranging from depression and diabetes to cancer, cardiovascular disease, and cognitive impairment. Wilson has endured plenty of criticism for her position, which is not popular among the nutrition-science establishment. But she stands by it. Sweeping recommendations to avoid all ultra-processed foods stand to confuse people and make them feel bad about their diets, Wilson says—with questionable upside for their health.

WHAT IS A PROCESSED FOOD, anyway? It's a rather new concept. Foods are mainly judged by how many vitamins, minerals, and macronutrients (think fat, protein, and carbs) they contain, as well as their sugar, salt, and saturated-fat contents. There's no level of processing on a food label.

Scientists don't agree on exactly how to define processed foods. If you give two experts the same ingredient list, "they will have different opinions about whether something is processed or not," says Giulia Menichetti, a principal investigator at Harvard Medical School who researches food chemistry. Take milk. Some experts consider it a processed food because it goes through pasteurization to kill pathogens. Others don't think it belongs in that category because plain milk typically con-



tains few additives beyond vitamins.

The most widely used food-classification system, known as NOVA, uses the latter interpretation. It defines an unprocessed food as one that comes directly from a plant or animal, like a fresh-picked apple. A minimally processed food may have undergone a procedure like cleaning, freezing, or drying, but hasn't been much altered from its original form. Examples include eggs, whole grains, some frozen produce, and milk.

Under NOVA, a processed food contains added ingredients to make it taste better or last longer, such as many canned products, cured meats, and cheeses. An ultra-processed food, meanwhile, is made largely or entirely from oils, sugars, starches, and ingredients

you wouldn't buy yourself at the grocery store—things like hydrogenated fats, emulsifiers, flavor enhancers, and other additives. Everything from packaged cookies to flavored yogurt to baby formula fits that description.

"You end up with a system where gummy bears and canned kidney beans" aren't treated so differently, says Julie Hess, a research nutritionist with the USDA. At the end of the day, they're both processed.

Why should that matter to anyone aside from researchers and dietitians? Because most people who care about their health have the same question about processed foods: Are they killing me? And right now—despite their looming possible inclusion in dietary guidelines—no one really knows the answer.

There's limited cause-and-effect research on how processed foods affect health, and scientists and policymakers have yet to come up with a good way to, as Hess says, "meaningfully delineate between nutrient-dense foods and nutrient-poor options"—to separate the kidney beans from the gummy bears.

Hess and her colleagues drove home that point in a 2023 study, for which they created a hypothetical diet almost entirely made up of ultra-processed foods like breakfast burritos, canned soup, and instant oatmeal. The diet wasn't nutritionally stellar—it was high in sodium and low in whole grains—but scored an 86 out of 100 on a measure of adherence to the federal dietary guidelines, considerably better than the average American's score of 59. The experiment highlighted that there are nutritious ultra-processed foods, and that certain ones "may make it easier and more convenient to have a healthy diet, because a lot of these foods are more shelf-stable, they're more cost-effective, they're sometimes easier to access," Hess says.

A 2024 study backs up the idea that people who eat processed foods can still be healthy. Although the researchers did find links between heavily processed diets and risk of premature death, they concluded that overall diet quality may be more important than how many processed foods someone eats. In other words, if someone is eating plenty of nutritious foods, maybe it's OK if some come from a wrapper. The study aimed to correct "the potential misperception that all ultra-processed food products should be universally restricted and to avoid oversimplification when formulating dietary recommendations," the authors wrote.

Even vocal critics of ultra-processed foods, like van Tulleken, agree that not all are equal. He's particularly concerned about those that are high in salt, sugar, or saturated fat, which is true of many ultra-processed foods but not all of them. These elements have long been nemeses of the nutrition world, but van Tulleken argues they're especially damaging when eaten in industrially made foods spiked with additives and designed to be as appetizing as possible. "We've had fat, salt, and sugar in abundance in our diet for a century,

and I'm the first to say they are the nutrients of concern," van Tulleken says. "But they weren't a concern when we were mixing them up at home, because when you cook at home, your purpose is not to get me to eat 3,000 calories in half an hour."

Industrial production means that ingredients undergo complex chemical changes, the implications of which researchers don't fully understand, says Menichetti, the food chemist. "We co-evolved with our food, so if our bodies got used to certain chemicals in certain ranges," altering foods' compositions via processing could change the way they affect human health, she says.

Already, some studies suggest that ultra-processed foods affect the body differently than unprocessed ones, regardless of their nutrient profiles. One 2024 study found that plant-based foods, which are traditionally considered healthy, lose many of their benefits and even contribute to higher risks of heart disease and death when they're ultra-processed (when a whole grain turns into store-bought bread, for example). And a 2020 review article found numerous bad outcomes—cancer, cardiovascular disease, IBS, depression, and more—linked to ultra-processed diets and not a single study connecting them to better health. Those results suggest that a food's processing level is linked to its "healthiness," the authors wrote.

A 2019 study from the National Institutes of Health (NIH) provides some of the strongest evidence that ultra-processed foods can directly cause health problems. For the study, 20 U.S. adults lived in an NIH laboratory for a month. For two weeks, they ate minimally processed foods like vegetables and nuts. For the other two, they ate ultra-processed foods like bagels and canned pasta.

The two diets were designed to be equivalent in calories, sugar, salt, and macronutrients, but people could eat as much or as little as they wanted at meal-times. On the ultra-processed diet, people ate more and gained weight. Meanwhile, on the minimally processed one, they lost weight, had positive hormonal

changes, and saw markers of inflammation drop. Those findings suggest something about ultra-processed foods drives people to overeat and may cause health problems, says lead author Kevin Hall—but it's not yet clear what that something may be.

"There's a very, very long list of potential candidates," Hall says. Is it the combination of ingredients manufacturers use to make foods tasty? Is there a problematic ingredient or additive? Does something about the manufacturing process degrade the food's quality? Or is the explanation something else entirely?

IN NOVEMBER, the 2025 Dietary Guidelines Advisory Committee is expected to release a report on ultra-processed foods, which will assess the available data on how they affect the body. More research is needed. But at a meeting in May, committee member Dr. Fatima Cody Stanford, an obesity-

accessible options, especially without providing an alternative or improving access and affordability of healthy foods," is not the answer, she says.

Despite his prominent campaign against ultra-processed foods, van Tulleken agrees. He realizes a ban on them wouldn't be practical; it would essentially wipe out the modern food system, with particularly disastrous consequences for people of lower socio-economic status. (He would, however, like to see more regulation of food marketing and warning labels on processed products high in salt, sugar, or saturated fat.) Though he feels strongly that ultra-processed foods are contributing to a modern public-health crisis, van Tulleken also recognizes that they serve an imperfect purpose in a world where many people are strapped for time and money.

Even Hall, the NIH researcher, eats ultra-processed foods—and not infrequently. Most days for lunch, he heats up a frozen meal in the microwave. "I'll try to choose one that is high in fiber and whole grains and legumes and low in sodium and saturated fat and sugar," he says. But he knows that technically, it's

in the same category as a Twinkie.

After her experiment last summer, Wilson also continues to eat plenty of processed foods—and to feel good about it. To her, the debate is about more than food; it's also about the realities of living in a country where grocery prices are spiking and lots of people simply don't have the resources to eat three home-cooked meals made from fresh ingredients every single day.

"People often assume that a dietitian's day is telling people to eat less," Wilson says. But she says she spends far more time helping people figure out how to eat more—whether because they're trying to feed a family on a tight budget or because they simply don't have time and energy to cook—and how to add nutrient-rich foods to their diets in a way that's affordable. For some of those people, ultra-processed foods may be the difference between going to bed hungry or full, Wilson says. She'd pick full every time. □

'HOW CAN THIS ENTIRE CATEGORY OF FOODS BE SOMETHING WE'RE SUPPOSED TO AVOID?'

—JESSICA WILSON, REGISTERED DIETITIAN

medicine specialist at Massachusetts General Hospital, previewed the group's findings: that people who eat highly processed diets are at risk of obesity.

Even with questions outstanding, we already know that some ultra-processed foods are harmful, says Kendra Chow, a registered dietitian and policy and public affairs manager at the nonprofit World Cancer Research Fund International. Stereotypical "junk foods" that are high in salt, sugar, or saturated fat—things like chips, candy, and hot dogs—have long been linked to health problems like cancer and heart disease. The science on those foods is clear enough that people should limit how often they eat them, she says.

What's trickier, Chow says, is figuring out what to do about foods that are ultra-processed but seem to have more nutritional value, like flavored yogurts and store-bought vegetable pasta sauces. "Stigmatizing a broad category of foods that also includes lower-cost,

Time Off

NATASHA ROTHWELL OUT FRONT

BY JUDY BERMAN

The creator-performer moves from beloved supporting roles to center stage in a deeply personal new comedy series



INSIDE

3 GREAT ACTORS PLAY
3 SPARRING SISTERS

A DOCUMENTARY LOOKS INTO
THE SOULS OF PSYCHICS

AN ILL-CONCEIVED ADAPTATION OF
A NONFICTION PAGE TURNER

AN ALLERGY TO OVER-THE-COUNTER PAIN medication changed Natasha Rothwell's life. Soon after she moved to Los Angeles, in 2015, to write for Issa Rae's era-defining HBO dramedy *Insecure*, she had some dental work done and found herself in so much pain that she popped an Advil and crossed her fingers that it would be OK. It wasn't. Realizing that the loud, ragged breathing she was suddenly hearing was her own, she drove herself to Cedars-Sinai in a panic.

The solo hospital trip forced the epiphany that, though rarely alone, she was profoundly lonely. "For the better part of my 20s, I was running around like a heat-seeking missile, trying to find the one," she recalls. "Being alone was the thing I thought I was afraid of." In search of love, she'd neglected friendships, family bonds, herself. "But in that moment, I was like 'Oh no, I'm lonely. It's not that I don't have someone here—it's that I didn't reach out to someone.'"

A decade or so (and many productive years of therapy) later, Rothwell, who has since appeared in fan-favorite roles in *Insecure* and *The White Lotus*, is sipping a colorful iced-tea drink in the verdant lounge of a Manhattan hotel, recounting how that terrifying incident inspired not just a personal reckoning, but also a creative breakthrough. On Sept. 13, Hulu will release the first series created by and starring the writer, actor, producer, and director. *How to Die Alone* casts Rothwell as Melissa, a self-conscious, self-sabotaging airport worker who has a brush with death during a lonely 35th birthday spent eating takeout and assembling Ikea-like furniture. Her hospital roommate, a wise older woman, urges her to "stop caring what other people think and start doing sh-t that scares you." This advice, coupled with the awareness that she could have died before she'd let her life truly begin, catalyzes Mel's bumpy transformation into a woman actively pursuing self-love, friendship, financial stability, professional fulfillment, adventure.

"I wanted to have the character have a near-death experience that woke her up to the fact that it's about partnership with yourself," she says. "If this is the period at the end of the sentence of my life, is it going to be a life worth living?" By turns funny, dark, and inspirational, *Alone* is a show about seizing the moment that could have come only from Rothwell's scrupulous examination of her own life.

AMONG HOLLYWOOD'S FAMOUS FACES, there are those who have never had to eke out a civilian living: nepo babies, child stars, Juilliard-trained phenoms. Then there are those who have a whole, regular adult existence behind them. That Rothwell, 43, belongs to the latter category is evident in the dignity she brings to characters living unglamorous lives and in her groundedness and perspective.

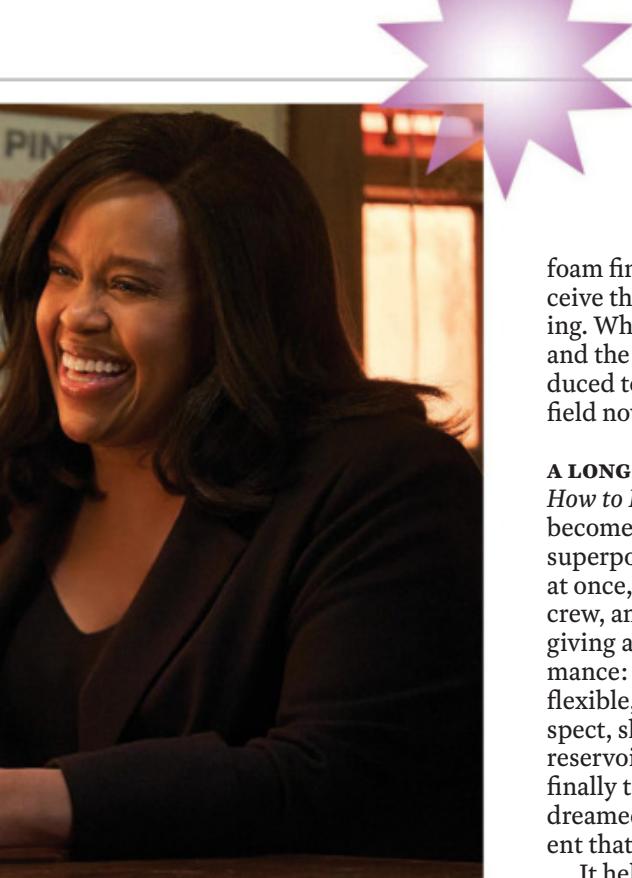
Growing up with a dad in the Air Force, she always felt she was meant to be an artist and seized the chance to perform a new persona every few years, when her family relocated and she and her three siblings started over in a new school. "Who do I want to be?" she would ask herself. "You know what? I'm gonna have a ratail." At Ithaca College, she switched from an Oprah-inspired journalism major to pursue her true love, theater. In 2009, she moved to New York.



In her first lead role, Rothwell plays a woman stepping out of the shadows

"I was like a weird superhero," she jokes. "I was a theater teacher by day and doing comedy at night," notably with Upright Citizens Brigade. The balancing act taught her to constantly hustle, but she found it difficult to translate her onstage triumphs into confidence in her personal life. "I felt like Clark Kent when I got off-stage," she recalls. The question was: "How do I be Superman in real life?"

As she worked to answer it, success came bit by bit. In 2014, she was hired as a writer on *SNL*. It wasn't the most supportive environment; she has said that as a Black woman, she worried about being seen as a diversity hire and would literally raise her hand to be heard. But *Insecure*, a show about young, professional Black women in L.A., functioned as a launching pad for Black talent, and no one benefited from Rae and showrunner Prentice Penny's shrewd eyes more than Rothwell. When her informal readings of boisterous wild card Kelli's lines cracked up the writers' room, they offered her the part. The character turned out to be more than just comic relief. "Brown-woman roles, especially supporting, can be broad," Rothwell notes. "So being able to have her be funny, hypersexual, love her body, love her friends, fiercely loyal—those



things excited me.” Kelli’s one-liners induced spit takes, but Rothwell’s vulnerability made her relatable and real.

By the summer of 2021, viewers could watch her as both the most off-beat presence in *Insecure* and as the most down-to-earth character in another HBO series: *The White Lotus*, auteur Mike White’s hit satirical murder mystery about obnoxious rich people at a luxury resort. A gentle spa manager paid to pamper ungrateful guests, Rothwell’s Belinda bonds with Jennifer Coolidge’s lost-soul heiress, Tanya, who offers to fund her dream wellness venture. As the rules of White’s class-conscious universe dictate, the partnership is doomed. Viewers couldn’t help but feel for Belinda. Yet Rothwell was caught off guard by the outpouring of love given how overlooked service workers often tend to be in life and in fiction. “It was beautiful to see audiences see her.”

Now, fresh off shooting the upcoming third season of *Lotus*—an anthology series in which Belinda will be the rare character to appear twice—in Thailand, Rothwell is touched to see audiences see her. “I don’t have main-character energy in life,” she says. That rings true; though a lively, engaged conversationalist, she doesn’t guzzle attention. “I’m in the stands with the

foam finger, like ‘Let’s go!’ So to receive that support has been very moving. When I posted the art for *[Alone]* and the messages came in, I was reduced to tears: ‘Oh, wow. I’m on the field now, and they’re in the stands.’”

A LONG-GESTATING PROJECT,

How to Die Alone required Rothwell to become the kind of superhero whose superpower is being in a dozen places at once, collaborating with cast and crew, and overseeing edits, all while giving a funny, poignant lead performance: “I felt like Simone Biles. I was flexible, I could do it all.” In retrospect, she suspects she found “this reservoir of energy” because she was finally telling the story she’d long dreamed about: “I was the most present that I think I’ve ever been on set.”

It helped to have role models and resources in two of TV’s most influential creator-performers, Rae and White (who previously starred alongside his co-creator, Laura Dern, in the HBO dramedy *Enlightened*). “They are unapologetically themselves,” Rothwell observes. “They fiercely protect their work, and they aren’t afraid of telling unique, interesting stories.” Similarly, in conceiving *Alone*, she trusted wisdom acquired over years of working to fuse her inner Clark Kent and Superman, and to honor the vulnerability that transformation demanded. “I wanted a show that speaks to what it means to be in the fray of living,” she says. “I didn’t want a before-and-after story. Let’s get messy. Let’s be in that muck together.”

Mel’s decision to take control of her life is only the beginning of a path strewn with obstacles. Among *Alone*’s most profound insights is that working on yourself means auditing

relationships of all kinds. Mel confronts a critical brother (Bashir Salahuddin) and a friend and co-worker (Conrad Ricamora) who takes her for granted. She felt strongly about looking past the first-class passengers TV loves to dissect in order to zoom in on working-class airport employees. “I have always been drawn to the characters we marginalize,” she says. When we center their daily struggles, flirtations, ambitions, “we consider that they’re more than one-dimensional people that help us get on a plane.”

Rothwell took a similarly humane approach to ensuring that her cast and crew were comfortable on set. She made a rule consistent with *Alone*’s insistence that its self-identified fat, Black, female protagonist is as worthy of love and respect as anyone else: “I was like ‘We’re not going to use the word *fat* pejoratively on set. You can’t eat a meal and say, ‘I feel so fat.’” In Ozempic-era Hollywood, this kind of talk can be an occupational hazard.

It all ties back to the experiment at the core of *Alone*: “Let’s see what happens when someone goes on that journey to figure out how to love themselves enough to stop hurting themselves.” For Rothwell, who is years farther down that road than Mel, making progress has meant seizing opportunities she never would’ve thought possible as a theater major who just wanted to work. This openness led to a scene-stealing role in last year’s big-budget musical *Wonka*, and makes her want to keep expanding her repertoire. For example? “Deadass: an action hero.” Also: “A horror story. I would kill to be in *Misery*.”

For now, though, she’s focused on the present, especially given the imminent threat to shows by and about women of color posed by the streaming contraction and the risk aversion of a poststrike Hollywood. “Coming out of the strike, there was a real fear: Will my show fall prey to that unconscious bias that seems to be expressing itself by having so many amazing shows go away?” she recalls. “That’s why I want to be present in this moment, because you just never know when something is going to go away.” □

‘I wanted a show that speaks to what it means to be in the fray of living.’

MOVIES

3 sisters and one empty recliner

BY STEPHANIE ZACHAREK

DEATH CAN BOTH TEAR FAMILY MEMBERS apart and bind them closer—often simultaneously. That's the mysterious dynamic writer-director Azazel Jacobs mines in *His Three Daughters*, a story of three mismatched sisters who gather in their childhood home, a modest, rent-controlled Manhattan apartment, to usher their dying father into the whatever-it-is-that-comes-next. The eldest, bossy, uptight Katie (Carrie Coon), feels the need to steer the ship, as everyone else seems incapable; she's particularly obsessed with a "Do not resuscitate" form that her father was supposed to have signed when he was still cogent. Christina (Elizabeth Olsen) has left her family, thousands of miles away, to join her sisters in this emotionally rattling endeavor. A onetime Deadhead and yoga nut, she seems to be the calmest of the lot, though her quietude barely masks her annoying self-absorption.

Then there's Rachel (Natasha Lyonne), who has been living in the apartment and caring for her father—though not well enough, according to Katie. (It was Rachel, naturally, who was supposed to facilitate the signing of that DNR form.) With their conventional thinking and ingrained momlike ways, Katie and Christina have invaded Rachel's space and cramped her style. Katie harangues her for waking-and-baking and looks askance at her sports betting. It doesn't help that Rachel isn't related by blood: Katie and Christina lost their mother when they were young, and their father remarried, accepting his new wife's daughter as his own. These are three women connected by one man, a father who has loved each disparate personality equally. That's a bond much thicker than blood, though these women haven't yet figured that out.

THE GREAT AND TERRIBLE THING about the death of a family member is that all survivors learn something new about themselves. Jacobs (director of movies like *French Exit* and *Momma's Man*) gives these three crackling, perceptive actors plenty to work with and then steps back to capture their workaday magic. There's nothing flashy about *His Three Daughters*; it has a lived-in feel, as if taking its cues from the apartment's central feature, the smooshy recliner that still bears the warm, invisible butt print of the family patriarch. (Played by Jay O. Sanders, he makes a late appearance that helps tie the

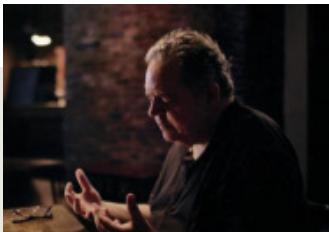


▲
Lyonne, Olsen, and
Coon: finding grace
amid discord

**There's
nothing
flashy about
*His Three
Daughters*;
it has a
lived-in feel**

movie's more elusive ideas into a tender wildflower bouquet.) Coon helps us see that if Katie stops nagging, she'll have to confront her real feelings, and who wants to do *that*? Olsen vests Christina with the winsome energy of a hummingbird—vibrating with all her might is what holds her together. And Lyonne adds some smudgy shading to the stock role of the eye-rolling stoner wisecracker; she learns that gliding over her feelings isn't the same as living through them.

There are whispers of Chekhov and Shakespeare in *His Three Daughters*; both of those writers knew a thing or two about the fractiousness, and the durability, of sisterly connections. But the best thing about *His Three Daughters* is the ending. Peaceful but in no way resolute, it offers each of its characters a graceful path forward. The death of a parent, devastating as it can be, always opens a door. But everyone can use a little help as they fumble toward it. □



One man's psychic is another man's empathetic listener

MOVIES

THE VIEW FROM BEYOND—MAYBE

You don't have to believe in the supernatural to feel the emotional pull of Lana Wilson's intimate documentary *Look Into My Eyes*, a glimpse into the not-always-so-mystical world of New York City psychics. There's the aspiring actor who realized he had a gift for picking up on psychic phenomena; the painter who wraps herself in sparkly shawls and tells fortunes at parties; the John Waters fan who has a knack for knowing what animals are thinking. Wilson steps into their lives, and into their sometimes very cluttered apartments, to find out why and how they do what they do. They open up to her as if she were the psychic, her antennae poised to pick up their secret hopes and fears.

Wilson—who co-directed the superb 2013 *After Tiller*—takes an empathetic approach not just to the people who do this work, but also to the people who seek their help. Most moving of all is the middle-aged pediatric surgeon who has questions about a child, the victim of a drive-by shooting, who died on her operating table in the early years of her career. "I guess my question is—how is she?" the woman asks tentatively.

She gets her answer in the film's final minutes. Has some actual psychic communication occurred? Who knows? You might come away thinking Wilson's subjects aren't necessarily clairvoyantly gifted, but just extremely good listeners. You might also come away convinced that's enough. —S.Z.

MOVIES

In My Old Ass, a teen gets an earful from her older self

IT'S ONE OF THOSE INTERVIEW questions asked of confident, accomplished women time and again: What advice would you give your younger self? Megan Park's *My Old Ass* riffs on that stock question, but with a smart, perceptive twist: instead of treating the younger self as a clueless naif, it recognizes that teenagers often have more emotional resilience than even they recognize.

Freewheeling, mildly reckless Elliott (*Nashville*'s Maisy Stella) can't wait for her life to start: in just a few weeks, she'll leave her family's Ontario farm for college in Toronto. The last thing she wants to be, she says, is a third-generation cranberry farmer, even if the idyllic, woodsy, lakeside setting of her life so far looks like the sort of place most people would want to rush toward. Still, she's making the most of her last days on her home turf, tooling around the lake in her rusty motorboat, striking up a last-minute romance with a cute girl, and heading off to an adorably spooky island to sip dubious-looking shroom tea with her best friends (played by Maddie Ziegler and Kerrice Brooks).

That mushroom tea is more than a little magic: while her friends are off

having your average, noodle-dance trip, Elliott finds herself sitting on a log, engrossed in deep discussion with a woman who claims to be her 39-year-old self (played by the luminously sardonic Aubrey Plaza). Older Elliott has lots of advice for the younger version: Wear your retainer. Spend more quality time with the family. And whatever you do, when you meet a guy named Chad—run.

Elliott is pretty sure she's gay. Enter Chad (Percy Hynes White), a lanky, goofball swain with a great, rubbery smile. She tries to run, but Chad turns out to be unavoidable, much to the dismay of older Elliott (who, defying all known rules of time and space, has programmed her number into younger Elliott's cell phone).

My Old Ass is a bit crazy. It's also winning, in the gentlest, sweetest way. Park's second feature (following her 2021 debut, *The Fallout*) is a pleasingly casual little movie that asks big questions in loopy, unfinished sentences. What teenager doesn't want to race toward the future? *My Old Ass* urges us to look back at the people we used to be, blurry and impatient, people who just couldn't wait to become—us. —S.Z.



Stella: racing toward the future, one mistake at a time

TELEVISION

An adaptation of *Three Women* makes four a crowd

BY JUDY BERMAN

FOR A WORK OF LITERARY NONFICTION TO thrill readers the way Lisa Taddeo's 2019 best seller *Three Women* has done, it must offer more than just rich subject matter. There has to be chemistry between the author and the story; readers have to feel her intimate understanding of its characters and ideas. Fittingly, given that *Three Women* is a triptych portrait of female desire in 21st century America, there's an element of seduction. Taddeo closes the deal by closing the space that separates herself from the women whose sex lives she chronicles. Their minds, hearts, and libidos speak so loudly, you might forget she's even there.

That such a feverish read was adapted into a steamy yet sad premium-cable drama is no surprise. Unfortunately, the series, despite having been created by Taddeo, breaks the book's sweaty spell. Like the text spun through a centrifuge, it pairs retellings of the women's stories with that of a fourth: the Taddeoesque journalist (Shailene Woodley's Gia) traveling to collect characters. Despite bold performances and sensitive directing that centers women's perspectives, its disjointed structure and flimsy frame narrative suggest the book might not have been so ripe for TV after all.

Taddeo sets the scene with an encounter between Gia and Gay Talese (James Naughton), a real-life titan of literary journalism whose 1981 tome on sex in the '70s, *Thy Neighbor's Wife*, Gia seeks to update—and a figure whose cultural significance and macho reputation will probably be lost on most viewers under 60. "You're gonna go out there and f-ck married men," Talese proclaims. But she doesn't, realizing early on that when it comes to sex, love, and specifically desire, women are more interesting.

The premiere introduces all three subjects. Lina, played with fire and desperation by Betty Gilpin, is an Indiana stay-at-home mom whose husband (Sean Meehan) won't kiss her. Starved for passion, she reconnects with a high school boyfriend who has loomed large in her fantasies. Sloane (a radiant DeWanda Wise), the belle of every Martha's Vineyard ball, satisfies her unruly lust by letting her husband (Blair Underwood) pick partners for her to sleep with as he watches. But then she becomes infatuated with a guy (Blair Redford) she doesn't want to share. And Maggie (Gabrielle Creevy) is a 23-year-old North Dakota



Gilpin, Wise, and Creevy in now disjointed stories

The book might not have been so ripe for TV after all

waitress who files charges against the boundary-crossing high school English teacher (Jason Ralph) who upended her life years earlier.

"**WHAT THEY ALL HAD**," Gia explains, in glib narration that belies Taddeo's capacity for nuance, "was the audacity to believe that they deserved more." But a scattered format reveals only how loosely they fit together. Buoyed by Gilpin's near feral vulnerability, only Lina embodies the intensity of a regular woman unmoored by desire. Based on a trial that didn't end well for the accuser, Maggie's story suffers from its similarity to so many other stories of teachers preying on students on TV. A WASP recast as a wealthy Black woman, presumably to diversify an otherwise white series, with only cursory attention paid to the implications of that identity shift, Sloane has a conspicuously lightweight arc.

Most incongruous is the Gia storyline. Instead of offering much insight into why she's staking her livelihood on this project, *Three Women* gives Gia a love interest and embroils them in a far-fetched conflict. It's not hard to understand why Taddeo felt compelled to tweak her book's structure for TV or to add a character who could shed light on a remarkable feat of reportage. But in decoupling her voice from those of her subjects, the series severs the mind-meld connection that made the book electrifying.

Three Women premieres Sept. 13 on Starz

Ketchup and Strawberries
Peril and Promise of AI



BY ANDREW BAKER
Senior Correspondent

An open letter written and signed by some of the biggest names in computer science has raised the frightening specter of global annihilation at the hands (digit?) of artificial intelligence. And while the 22-word statement is short on specifics, the signatories—among them ChatGPT's developer Sam Altman—are knowledgeable enough to know what they are talking about. But AI,



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Justin Theroux

The Emmy-winning actor, writer, and producer on *Beetlejuice*, *Beetlejuice*, his roles in cult classics, and the enduring love for *The Leftovers*

It's been over 35 years since *Beetlejuice* was released. Were you a fan of the original movie when it came out? I was absolutely a fan. It came out at a time when I wasn't aware of what was a studio movie vs. an independent movie. But it definitely felt very independent and like it was just mine. I loved it.

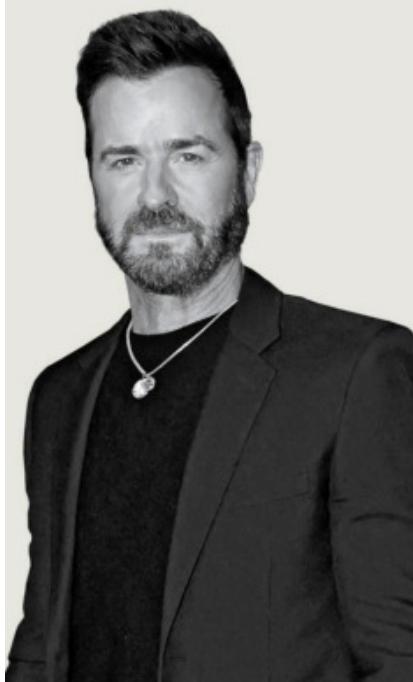
What stood out to you about Tim Burton's process as a filmmaker? We're blessed with very few directors whose films are just so singular and so visionary, and where there's a very short distance between their brain and the screen. [Federico] Fellini is one. And [David] Lynch. I think Tim falls into that category. We're lucky enough that the system has allowed him to have that outlet and sort of create his own genre. He really does make [all of his movies] feel like independent films. He puts a very thick, cozy bubble on the cast and the day's work. He's also incredibly energetic, like water skidding across a hot pan. He rarely puts his butt down on his director's chair.

Other than *Beetlejuice*, do you have a favorite Tim Burton movie? I adore almost all of his films, but one that's very dear to me is *Pee-wee's Big Adventure*. His first film. I hadn't seen anything like that before.

You star opposite Winona Ryder as the iconic Lydia Deetz. What was it like seeing her bring such a beloved character back to life? She was the character in [*Beetlejuice*] that I gravitated toward most. She was roughly the same age when she made it as I was when I had a ticket torn for it. And it was the first time I saw reflected onscreen what I now know every teenager feels, which is this sort of misanthropic ennui or sadness. So it was really fun to see her on our first day of hair and

What appeals to you about comedy vs. more dramatic roles?

With comedy, everything's lighter on its feet. It's the difference between playing tackle football and Nerf darts. When you're doing drama, there's a lot of "Quiet on the set!" and the days can feel a bit longer, whereas with comedy the time seems to fly by.



makeup tests with those cat's-claw bangs and updated black dress. It was like, Oh, that's exactly how I would envision her 35 years later.

You play Rory, a smarmy con-artist type who's dating Lydia. How did you approach that role? Playing shallow and dim and not very bright is really fun. And then me and Tim had these long discussions about how we wanted [Rory and Lydia] to feel believable as a couple, but it's just this incredibly ingrown toenail of a co-dependent relationship.

This isn't your first rodeo with cult classics. What does it mean to you to have been a part of so many projects that fans feel such an intense connection to? Nothing's a cult classic until years later. No one sets out to make cult classics. I feel really lucky to work with good enough actors and directors to have made a couple films like that. The films I love are like finding old vinyl in a record store. The ones you feel like you discovered on your own or found years after they'd come out.

***The Leftovers* consistently appears on lists of the best TV shows of all time. Why do you think that story continues to resonate so deeply?**

At the end of the day, that series was about something we all experience in our lives, which is grief and death. And it did such a beautiful job of gently wrapping its arms around that subject. Films and TV shows deal with difficult subjects all the time, but the supernatural premise that [*The Leftovers*] opens with wasn't what was fully explored in its three seasons. It quickly gets away from that. Add to that the writing, direction, and performers were all so incredibly good. I think that's why it endures. —MEGAN MCCLUSKEY

From top priorities for the future to key lessons provided by history, expert insights on AI in a special section exclusively for Dreamforce

FEATURING

EDWARD
NORTON

SASHA
LUCCIONI

WILL.I.AM

VIPUL VED
PRAKASH

RAJ
SUBRAMANIAM

What Should Be the Top Focus for AI Leaders?

Five trailblazers in the world of artificial intelligence on priorities for the year ahead



Cristóbal Valenzuela

CO-FOUNDER AND CEO
RUNWAY

OVER THE COURSE OF THE next year, our industry needs to reset the way we talk about AI to both manage expectations of what progress looks like and bring bright, creative minds with us along the way.

This will require a collective effort to communicate our vision clearly and maintain transparency around our advancements, and it will be important to do this in a way that does not create fears or make these products out to be more than just that—products.

At Runway, we're building significantly more advanced, accessible, and intuitive technologies and tools for our millions of

creative users around the world. Our successes and future growth are driven by the strong community we've built through our work with artists and creatives—understanding their needs and how they approach their crafts will always be the priority.

You can see this manifested through initiatives like our annual AI Film Festival, our Gen:48 short-film competition, and our new Research and Art (RNA) community Q&A sessions.

These have all provided a platform for artists, which in turn has driven our growth and mission of empowering these artists.



Edward Norton

CO-FOUNDER AND CHIEF STRATEGY OFFICER
ZECK



From a high level, we need something akin to the medical Hippocratic oath, which governs doctors to do no harm. It's for others to decide whether that's regulation or something else, but we need a framing commitment.

I often come at things from a narrative place, and I've always been struck by writer Isaac Asimov's *Robot* series, in which he



Sasha Luccioni

AI AND CLIMATE LEAD
HUGGING FACE

I think that we should be focusing on transparency and accountability, and communicating AI's impacts on the planet, so that both customers and members of the community can make more informed choices.

We don't really have good ways of measuring the sustainability or the labor impact of AI. And what would be useful is to develop new ways of reflecting on how switching from

one type of AI tool or approach to another changes the environmental impact.

For example, Google switched from good old-fashioned AI to generative AI summaries for web search. I think that's where customers really want more information. They want to know: What do these AI summaries represent in terms of societal and planetary impacts?

In my research, we found that switching from extractive AI to generative AI actually comes with 10 to 20 times more energy usage for the same request.

We can't opt out of new technology—and yet we don't know how many more computers are needed; how much more energy or water is needed; how many more data centers they

have to build in order for people to be able to get these AI summaries that they didn't really ask for in the first place.

That's where the transparency is missing because for a lot of people, they are mindful of the climate. And so I think that companies have a responsibility to their customers to say, "This is how much more energy you're using."



THE DIAGNOSTIC
POTENTIAL OF AI WILL
CONTINUE TO EVOLVE

weaves meditations around how societal principles and protections are included in the laws of robotics on an almost engineered basis. Similarly, we need someone to assert a foundational principle for all of us that AI shouldn't do harm.

On balance, at the phase we're in right now, I see far more benefits than any actual realized negatives. I think what's going on in medicine alone should give people a lot of enthusiasm for the positive potential in AI. That's the field in which I've seen things I think are truly astonishing, and are going to lead to real revolutions in human health and quality of life for a lot of people.

Even just AI in radiology: the capacity of AI and machine learning to just do a much, much better job than human interpretation of cancer screening. And instead of turning to treatments that have low efficacy because we're throwing a dart at the wall, we're starting to see the capacity of AI to create bespoke, curated, data-driven conclusions about what will benefit an individual person vs. a population.

The diagnostic potential in AI, or the interface between diagnosis and treatments that will have efficacy, combined with genetics—it just really starts to get into a world that, to me, is really positive.

But we need an ethical baseplate to do no harm. How that gets actually structured and expressed, both on an engineered, technological level and a societal, governing level, is going to be one of the really big questions and challenges of the next few decades.

Robert Wolfe

CO-FOUNDER
ZECK



AI HAS THE POTENTIAL TO transform efficiency: it gives us the opportunity to both save people time and help create audience-specific content.

I am seeing it firsthand across several companies that I've been lucky to work with. For example, think about a GoFundMe campaign. If AI can help you generate your narrative in a way that makes your audience more passionate about your cause, that could be monumental for someone raising money for their neighbor.

The No. 1 angst amongst our customers at Zeck is creating infographics, charts, and graphs. Such a pain. There is not a single

person in the world who likes creating charts and graphs. But Zeck AI looks at your table or data and suggests, "This may look good as a pie chart," and creates that pie chart for you. You can choose to accept it, iterate on it, or decline it. And Zeck AI will come up with red flags as you build your narrative that you wouldn't have thought of. Just imagine the time savings for someone who typically spends hours upon hours building everything from scratch. Now it takes minutes. Mind-blowing.

I am certainly not saying that AI should replace people, but AI will definitely make everyone more efficient.



Jack Hidary

CEO
SANDBOX AQ

With LQMs, breakthroughs that were seemingly impossible 24 months ago are now bearing fruit, transforming industries and pushing the boundaries of what is possible with AI.

Enterprises are realizing they need to implement LQMs and LLMs in order to extract maximum benefits. If CEOs focus solely on LLM-powered AI solutions for customer service, marketing, document creation, digital assistants, etc., they will likely fall behind competitors who are leveraging LQMs to transform processes, create innovative new products, or solve computationally complex problems.

For the past 20 months, generative AI and large language models (LLMs) have dominated the mindshare of leaders and driven countless innovations. However, C-suite execs and AI experts need to start looking beyond the capabilities—and limitations—of LLMs and explore the larger, more profound impact that large quantitative models (LQMs) will have on their organization and industry.

While LLMs are centered on our digital world—creating

content or deriving insights from textual or visual data—LQMs drive impact on the physical world and the financial-services sector. LQMs leverage physics-based first principles to generate new products in sectors such as biopharma, chemicals, energy, automotive, and aerospace. They can also analyze large volumes of complex numerical data to optimize investment portfolios and manage risk exposure for financial companies.



The Long Road to Genuine AI Mastery

The evolution of personal computing shows us why peak AI is still 50 years away

By Vipul Ved Prakash

IN THE EARLY 1970S, PROGRAMMING computers involved punching holes in cards and feeding them to room-size machines that would produce results through a line printer, often hours or even days later.

This is what computing had looked like for a long time, and it was against this backdrop that a team of 29 scientists and researchers at the famed Xerox PARC created the more intimate form of computing we know today: one with a display, a keyboard, and a mouse. This computer, called Alto, was so bewilderingly different that it necessitated a new term: *interactive computing*.

Alto was viewed by some as absurdly extravagant because of its expensive components. But fast-forward 50 years, and multitrillion-dollar supply chains have sprung up to transform silica-rich sands into sophisticated, wondrous computers that live in our pockets. Interactive computing is now inextricably

woven into the fabric of our lives.

Silicon Valley is again in the grip of a fervor reminiscent of the heady days of early computing. Artificial general intelligence (AGI), an umbrella term for the ability of a software system to solve any problem without specific instructions, has become a tangible revolution almost at our doorsteps.

THE RAPID ADVANCEMENTS in generative AI inspire awe, and for good reason. Just as Moore's Law charted the trajectory of personal computing and Metcalfe's Law predicted the growth of the internet,

an exponential principle underlies the development of generative AI. The scaling laws of deep learning postulate a direct correlation between the capabilities of an AI model and the scale of both the model itself and the data used to train it.

Over the past two years, the leading AI models have undergone a staggering 100-fold increase in both dimensions, with model sizes expanding from 10 billion parameters trained on 100 billion words to 1 trillion parameters trained on over 10 trillion words.

The results are evocative and useful. But the evolution of personal computing offers a salutary lesson. The trajectory from the Alto to the iPhone was a long and winding path. The development of robust operating systems, vibrant application ecosystems, and the internet itself were all crucial milestones, each of which relied on other subinventions and infrastructure: programming languages, cellular networks, data centers, and the creation of security, software, and services industries, among others.

AI benefits from much of this infrastructure, but it's also an important departure. For instance, large language models (LLMs) excel in language comprehension and generation, but struggle with reasoning abilities, which are crucial for tackling complex, multistep tasks. Yet solving this challenge may necessitate the creation of new neural network architectures or new approaches for training and using them, and the rate at which academia and research are generating new insights suggests we are in the early innings.

The training and serving of these models, something that we at Together AI focus on, is both a computational wonder and a quagmire. The bespoke AI supercomputers, or training clusters, created mostly by Nvidia, represent the bleeding edge of silicon design. Comprising tens of thousands of high-performance processors interconnected via advanced optical networking, these systems function as a unified supercomputer.

A lot remains to be done, and we get to shape our future with AI

However, their operation comes at a significant cost: they consume an order of magnitude more power and generate an equivalent amount of heat compared with traditional CPUs. The consequences are far from trivial. A recent paper published by Meta, detailing the training process of the Llama 3.1 model family on a 16,000-processor cluster, revealed a striking statistic: the system was inoperable for a staggering 69% of its operational time.

As silicon technology continues to advance in accordance with Moore's Law, innovations will be needed to optimize chip performance while minimizing energy consumption and mitigating the attendant heat generation. By 2030, data centers may undergo a radical transformation, necessitating fundamental breakthroughs in the underlying physical infrastructure of computing.

Already, AI has emerged as a geopolitically charged domain, and its strategic significance is likely to intensify, potentially becoming a key determinant of technological pre-eminence in the years to come. As it improves, the transformative effects of AI on the nature of work and the labor market are also poised to become an increasingly contentious societal issue.

But a lot remains to be done, and we get to shape our future with AI. We should expect a proliferation of innovative digital products and services that will captivate and empower users in the coming years. In the long run, artificial intelligence will bloom into superintelligent systems, and these will be as inextricably woven into our lives as computing has managed to become. Human societies have absorbed new disruptive technologies over millennia and remade themselves to thrive with their aid—and artificial intelligence will be no exception.

Prakash is the co-founder and CEO of Together AI

WILL.I.AM: IVAN APFEL—GETTY IMAGES

Will.i.am's Radio Revolution

Could AI transform how we listen to music?
By Tharin Pillay

Tune in to RAiDiO.FYI, the new project from Will.i.am, and you'll be welcomed by an AI host "live from the ether," says the Black Eyed Peas front man. But his set of interactive radio stations—themed around topics like sport, pop culture, and politics—is different from previous AI-driven musical products. Unlike, for example, Spotify's AI DJ, RAiDiO.FYI permits two-way communication.

The stations can be accessed on FYI—which stands for Focus Your Ideas—a communication and collaboration app created by FYI.AI, founded by Will.i.am in 2020. Each station exists as a "project" within the app. All the relevant content, including the AI host's script, music, and segments, are loaded in as a "mega prompt" from which the tool—powered by third-party large language models—can draw. AI personas also have limited web-browsing capabilities and can pull information from trusted news sources.

"This is Act I," the musician, entrepreneur and tech investor told TIME while demonstrating RAiDiO.FYI on Aug. 20, National Radio Day in the U.S.

While most of the nine currently available stations have been created by the FYI.AI team, he says Act II involves partnerships with creators



across the entertainment and media industries.

Will.i.am envisions this idea of an interactive text-to-station as working beyond just radio and conferencing.

"It could be learning for tutors and teachers. It could be books for authors. It could be podcast segments for podcasters. It can be whatever it is the owner of that project [wants] when we partner with them to create that station," he says, emphasizing that the platform creates fresh possibilities for how people engage with content.

This is not Will.i.am's first foray into the world of AI. The artist, who has been using technology to make music for decades, started thinking seriously about the subject in 2004, when he was introduced to its possibilities by pioneering professor and AI expert Patrick Winston.

In January, he launched a radio show on SiriusXM that he co-hosts with an AI called Qd.pi. He also sits on the World Economic Forum's Fourth Industrial Revolution Advisory Committee and regularly attends the organization's annual meetings in Davos, Switzerland, to discuss how technology shapes society. He previously served as chip manufacturer Intel's director of creative innovation, and in 2009 launched the i.am Angel Foundation to support young people studying computer science and robotics in the Los Angeles neighborhood where he was raised.

The Black Eyed Peas' 2010 music video for the song "Imma Be Rocking That Body" begins with a skit where Will.i.am shows off futuristic technology that can replicate any artist's voice, to his bandmates' dismay. That technology is possible today.

FYI's AI personas may still have the distinctive sound of an AI voice and—like most large language models—the potential to be influenced by malicious prompting, yet they offer a glimpse into the future that is already here. And it won't be long, says Will.i.am, before it's not just the station hosts but also the music itself that is AI-generated.

WILL.I.AM HAS A VISION FOR THE FUTURE OF RADIO

What Oil's History Reveals About AI's Future

Mistaking the scramble for data for the (false) scarcity behind “Peak Oil”

By Niall Ferguson and John-Clark Levin

IS THE AI BUBBLE ABOUT TO BURST? EVERY day that the stock prices of semiconductor champion Nvidia and the so-called Fab Five tech giants (Microsoft, Apple, Alphabet, Amazon, and Meta) fail to regain their midyear peaks, more people ask that question.

It would not be the first time in financial history that the hype around a new technology led investors to drive up the value of the companies selling it to unsustainable heights—and then get cold feet. Political uncertainty around the U.S. election is itself raising the probability of a sell-off, as Donald Trump expresses his lingering resentments against the Big Tech companies and his ambivalence toward Taiwan, where semiconductors essential for AI mostly get made.

The deeper question is whether AI can deliver the staggering long-term value the internet has. If you invested in Amazon in late 1999, you would have been down over 90% by early 2001. But you would be up over 4,000% today.

A chorus of skeptics now loudly claims that AI progress is about to hit a brick wall. Models such as GPT-4 and Gemini have already hoovered up most of the internet’s data for training, the story goes, and will lack the data needed to get much smarter.

However, history gives us a strong reason to doubt the doubters. Indeed, we think they are likely to end up in the same unhappy place as those who in 2001 cast aspersions on the future of Jeff Bezos’ scrappy online bookstore.

THE GENERATIVE-AI REVOLUTION has breathed fresh life into the TED-ready aphorism “Data is the new oil.” But when LinkedIn influencers trot out that 2006 quote by British entrepreneur Clive Humby, most of them are missing the point. Data is like oil, but not just in the facile sense that each is the essential resource that defines a technological era. As futurist Ray Kurzweil observes, the key is that both data and oil vary greatly in the difficulty—and therefore cost—of extracting and refining them.

Some petroleum is light crude oil just below the ground, which gushes forth if you dig a deep



enough hole in the dirt. Other petroleum is trapped far beneath the earth or locked in sedimentary shale rocks, and requires deep drilling and elaborate fracking or high-heat pyrolysis to be usable. When oil prices were low before the 1973 embargo, only the cheaper sources were economically viable to exploit. But during periods of soaring prices over the decades since, producers have been incentivized to use increasingly expensive means of unlocking further reserves.

The same dynamic applies to data. Some data exist in neat and tidy datasets—labeled, annotated, fact-checked, and free for download in a common file format. But most data are buried more deeply. Data may be on badly scanned handwritten pages; may consist of terabytes of raw video or audio, without any labels on relevant features; may be riddled with inaccuracies and measurement errors or skewed by human biases. And most data are not on the public internet at all.

An estimated 96% to 99.8% of all online data is inaccessible to search engines—for example, paywalled media, corporate databases, and medical records. In addition, the vast majority of printed material has still never been digitized—around 90% for high-value collections such as the Smithsonian and U.K. National Archives, and likely a much higher proportion across all archives worldwide.

Yet arguably the largest untapped category is information that’s currently not captured in the



first place, from the hand motions of surgeons in the operating room to the subtle expressions of actors on a Broadway stage.

For the first decade after large amounts of data became the key to training state-of-the-art AI, commercial applications were very limited. It therefore made sense for tech companies to harvest only the cheapest data sources. But the launch of OpenAI's ChatGPT in 2022 changed everything. Now, the world's tech titans are locked in a frantic race to turn theoretical AI advances into consumer products worth billions. Many millions of users now pay around \$20 per month for access to the premium AI models produced by Google, OpenAI, and Anthropic.

But this is peanuts compared with the economic value that will be unlocked by future models capable of reliably performing professional tasks such as legal drafting, computer programming, medical diagnosis, financial analysis, and scientific research.

The skeptics are right that the industry is about to run out of cheap data. As smarter models enable wider adoption of AI for lucrative use cases, however, powerful incentives will drive the drilling for ever more expensive data sources—the proven reserves of which are

orders of magnitude larger than what has been used so far. This is already catalyzing a new training-data sector, as companies including Scale AI, Sama, and Labelbox specialize in the digital refining needed to make the less accessible data usable.

THIS IS ALSO an opportunity for data owners. Many companies and nonprofits have mountains of proprietary data that are gathering dust, but which could be used to propel the next generation of AI breakthroughs. OpenAI has spent hundreds of millions of dollars licensing training data, inking blockbuster deals with Shutterstock and the AP for access to their archives. Just as there was speculation in mineral rights during previous oil booms, we may soon see a rise in brokers finding and licensing data in the hope of cashing in when AI companies catch up.

Much like the geopolitical scramble for oil, competition for top-quality data is likely to affect superpower politics. Countries' domestic privacy laws affect the availability of fresh training data for their tech ecosystems. The European Union's 2016 General Data Protection Regulation leaves Europe's nascent AI sector with an uphill climb to international competitiveness, while China's expansive surveillance state allows Chinese firms to access larger and richer datasets than can be mined in America. Given the military and economic imperatives to stay ahead of Chinese AI labs, Western firms may thus be forced to look overseas for sources of data unavailable at home.

Yet just as alternative energy is fast eroding the dominance of fossil fuels, AI developments may reduce the industry's reliance on massive amounts of data. Premier labs are now working to perfect techniques known as "synthetic data" generation and "self-play," which allow AI to create its own training data. And while today's models learn several orders of magnitude less efficiently than humans, as they develop more advanced reasoning, they will likely be able to hone their capabilities with far less data.

There are legitimate questions about how long AI's recent blistering progress can be sustained. Despite enormous long-term potential, the short-term market bubble will likely burst before AI is smart enough to live up to the white-hot hype. But just as generations of "peak oil" predictions have been dashed by new extraction methods, we should not bet on an AI bust due to data running out.

Ferguson is the author of 16 books; Levin is research lead at Kurzweil Technologies

In Conversation With Raj Subramaniam

FedEx's second CEO ever shares his vision for the company

I know that you studied chemical engineering in India and the U.S. How did you get into the corporate world?

Growing up in India, I had two choices, either be an engineer or a doctor. My mother was a doctor, and there's no way I was going to do that. In India, there was a well-worn but narrow path that some of the top students got scholarships to go to the United States to pursue a master's degree in engineering. Once I got here, I figured out that a job in engineering wasn't what I was going to do. I decided that I was going to pursue a business career, and went on to do an M.B.A. from the University of Texas at Austin.

What attracted you to FedEx specifically after you got your M.B.A.?

It was 1991 and we were in the depths of the recession. People like me who didn't have a green card had a very, very tough go of it. When FedEx came to campus. I remember walking into the interview and basically saying, "Listen, I don't have a green card." And they looked at me and said, "Let's first figure out whether you have what it takes to do a job at FedEx, and then let's worry about the paperwork." That was the first company who said that, and the rest is history.

Demand for FedEx's services has slowed significantly since the start of the pandemic. Are you concerned?

We are now four years past the pandemic. The first two years we saw significant growth, and then in the last two years we've seen a slight slowdown. If you look back over the four-year period, you'd say that we saw normal levels of growth over those four years.

How have you adjusted to the drop in demand?

Our mission now has evolved to make supply chains smarter for everyone. We are sitting on top of insights about the global supply chain every single day.

So we have built the data infrastructure to capture those insights.

What is an example of one such insight, and how would it make the supply chain smarter?

When a consumer orders something online, that information instantly passes on to FedEx. It now arrives in FedEx's system maybe 12 hours before it used to. Those 12 hours are a lifetime for FedEx, and so we are able to plan our assets better for that traffic. Because of the use of artificial intelligence and machine learning, we are continuously improving our predictability of when that package is going to arrive, keeping in mind the latest and greatest in terms of weather conditions, traffic patterns, and so on.

When did you implement that and what was the motivation behind it?

We began working to create such a capability back in 2020.

Was that motivated by the pandemic?

This was actually independent of the pandemic. It was the direction we were heading anyway, because we realized that the value of the data that we are sitting on is quite significant.

In recent FedEx earnings calls you've placed a lot of focus on increasing cost savings—how do you do that without cutting too much?

From the very get-go of FedEx, our founding philosophy has been very straightforward. We take care of our people, who provide outstanding service and experience for our customers, which in turn generates profits for our company. What is unique about the last few quarters is that the market itself has been down since the pandemic for about five or six quarters in a row. But what we have done really well in this time frame is continue to gain market share in a down environment.

Would a regular person sending a package notice the changes you've implemented at FedEx? As an end consumer, you're going to see much more predictability in terms of when the packages arrive at the doorstep. From a shipper perspective, the pickup experience is going to get significantly better as well. —ALANA SEMUELS





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